ANTARCTIC BIBLIOGRAPHY

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ANTARCTIC BIBLIOGRAPHY

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Introduction

This volume is the sixth in a continuing series of compilations presenting abstracts and indexes of current Antarctic literature published since 1962. A companion volume to the series, *Antarctic Bibliography, 1951–1961,* extends the coverage retrospectively.

The material has been compiled over a period of approximately 20 months; the cutoff date for inclusion in this volume was June 1973. To provide current awareness, the abstracts have also been distributed monthly, through August 1972 in the form of 3- by 5-inch cards and subsequently as monthly bulletins under the title *Current Antarctic Literature.* The bulletins are generated from a computerized data base which is also used in producing this cumulated listing and the indexes.

The present volume contains 2,245 abstracts, numbered from 10,001 to 12,245. Previous volumes each contained 2,000 abstracts. Thus, items 1-2,000 appeared in volume 1 (published in 1965), items 2,001-4,000 in volume 2 (1966), items 4,001-6,000 in volume 3 (1968), items 6,001-8,000 in volume 4 (1970), and items 8,001-10,000 in volume 5 (1971).

The material is arranged in sections representing 13 subject categories (see table of contents). Items that apply to two or more categories are listed in one section only and cross-referenced at the end of the other pertinent sections. Within each section, abstracts are arranged by accession number; the indexes are keyed to these numbers.

Foreign-language titles are given in English translation first, with the original title following in parentheses. Transliteration of Cyrillic and romanization of oriental languages follow the Library of Congress systems, but without diacritical marks. Some of the citations are followed by Library of Congress call numbers. In a few instances call numbers of other libraries are given, preceded by the library symbols commonly used in union catalogs.

As a rule, the abstracts are informative rather than descriptive, but no attempt is made to verify or critically evaluate the author's statements or conclusions. Author abstracts are either used unchanged or modified for the sake of brevity or conformity to guidelines adopted for this bibliography.

Four indexes are provided: (1) an author index that includes coauthors; (2) a subject index that occasionally extends to two levels of subheadings and contains cross-references; (3) a geographic index that contains names of places, stations, and geographic features as approved by the U.S. Board on Geographic Names; and (4) a grantee index to names of organizations or institutions that received financial support from the National Science Foundation for work that resulted in publications abstracted in the volume. In each index, entries are cited by a letter, indicating the subject category, followed by the accession number; for example, B-11392 refers to section B, Biological Sciences, item number 11392.

Although the majority of the publications abstracted were in the collections of the Library of Congress, many significant items were lent by or exchanged with other institutions, made available by the Office of Polar Programs of the National Science Foundation, or received as review copies or reprints directly from publishers and authors.

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Because they contribute to more current and complete coverage, review copies and reprints are especially valuable, and publishers and authors are encouraged to send them to the Library of Congress, Science and Technology Division, Cold Regions Bibliography Project, 10 First Street SE., Washington, D.C. 20540, U.S.A.

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Geza T. Thuronyi, *Head*
Cold Regions Bibliography Project
Science and Technology Division
Library of Congress

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A. GENERAL

A-10016
Dukert, J.M.
ANTARCTICA: A NATURAL LABORATORY -- WITH DIVIDENDS FOR THE FUTURE. Smithsonian, Nov. 1971 12(8), p.45-51
AS30.S6

A popular account is given of the research opportunities offered by the vast continent of Antarctica. The discussion includes geographical features, plant and animal life, personnel, support aircraft, pollution and control systems, tourism, and conservation measures. A current cooperative effort is the International Antarctic Glaciological Project, begun this year, in which scientists from the U.S., the U.K., the Soviet Union, France, and Australia are collaborating in a broad scrutiny of a vast ice cap area, covering most of East Antarctica. Interpretation of results over a 10-yr period could give definite information on whether normal climate cycles and the effects of global industrialization are combining to shrink or expand the ice cap.

A-10022
Scott, P.
TOURISTS IN THE WAKE OF ANTARCTIC EXPLORERS. Geographic magazine, Oct. 1971 54(1), p.39-42
G1.G343

A tourist's account is given of 2 Lindblad Explorer tours -- one to the Antarctic Peninsula in 1969, and the other to the Ross Sea and McMurdo Sound in Feb. 1971. All of the historic huts in Antarctica were visited, including the Cape Evans hut built by Capt. Scott's Terra Nova expedition in Jan. 1911; the Shackleton hut at Cape Royds, built in Feb. 1908; the Discovery hut at McMurdo built by Capt. Scott's first expedition in 1902; and 3 huts at Cape Adare, one of which is half ruined. Two of the huts at Cape Adare were built by Borchgrevink in 1899 and are the oldest in Antarctica. The huts at Cape Evans, Cape Royds, and McMurdo are maintained as museums and contain stores and accoutrements left behind by past explorers. The wildlife of the area is briefly mentioned.

A-10023
Smiley, T.L. , Zumberge, J. H.
POLAR DESERTS. Science, Oct.1, 1971 174(4004), p.79-80
Q1.S35

In man's search for minerals and other resources in the earth's crust it now appears feasible to exploit the polar areas. Perhaps the most habitable parts of the polar regions are the "desert" areas, which may be arbitrarily defined as glacier-free terrestrial areas with a mean annual precipitation less than 25 cm and a mean temperature for the warmest month of less than 10C. The Sahara Desert generally receives approx 17 to 18 cm of precipication whereas Antarctica receives approx 15 cm and Perry land in northern Greenland, 10 to 12 cm. The AAAS Committee on Arid Lands has arranged a symposium on polar deserts to be held on Dec. 29-30, 1971 to examine various aspects of the natural environment of polar desert areas -- the people who have inhabited these areas, the economic base for the development of resources, and several of the problems which will confront people moving to those areas. The topics and speakers for the symposium are listed.

A-10038
Robin, G. de Q.
OBITUARY, JOHN SCHELDERUP GIAEVER. Polar record, May 1971 15(98), p.764-765

John Schelderup Giaever, leader of the Norwegian-British-Swedish Antarctic Expedition, 1949-52, died in Oslo on Nov. 9, 1970. From 1957 to 1956, except for war service and his period in the Antarctic, he led the annual Norwegian Government relief expeditions to NE Greenland. He became Office Chief of Norsk Polarinstitutt in April 1948, and his personality and qualities of leadership led Harald Sverdrup, the new Director, to invite him to lead the antarctic expedition. The appointment of an ex-hunter, journalist and Air Force officer to lead a major scientific expedition to the Antarctic was at first sight unusual; although he was not fit enough at the age of 50 to take an active part in field exploration, he had the personality and experience to keep a firm but gentle hand on the activities of the expedition. The success of the expedition as an international project, and as a fresh scientific attack on many problems of the Antarctic, was told effectively, with some fine passages, in Giaever's official account of the expedition. This has been published in at least eight languages, the English version being The white desert (London, 1954). For his leadership of this expedition, Giaever was awarded the Patron's Medal of the Royal Geographical Society in 1956.

A-10039
Willett, R.W. , Adams, R.D., Griffiths, D.H.
REPORTS ON THE SCAR/IUGS SYMPOSIUM ON ANTARCTIC GEOLOGY AND SOLID EARTH GEOPHYSICS, OSLO, 6-15 AUGUST 1970. Polar record, May 1971 15(98), p.821-829, Also in SCAR Bull., No. 38:821-829, May 1971.

A total of 132 papers based on field work in E. and W. Antarctica, the Antarctic Peninsula, the Southern Ocean, and the Subantarctic Is. were presented at the symposium which was concerned with the geological geometry of Antarctica. Comparison of papers given at the 1963 symposium indicated a considerable increase of geological interest in the Antarctic Peninsula area and in oceanographic studies and less interest in the Trans-Antarctic Mts. This report on the presentations and discussions at the symposium is divided into 3 sections: (1) Geology, by R.W. Willett, (2) Geophysics, by R.D. Adams, and (3) Marine geophysics, by D.H. Griffiths.

A-10040
International Council of Scientific Unions. Scientific Committee on Antarctic Research
INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT. Polar record, May 1971 15(98), p.829-833, Also in SCAR Bull., No. 38:829-833, May,1971.

This project is a long-term program of glaciclogical research in Antarctica, to be carried out jointly by Australia, France, the United States, and USSR. The area bounded by 60 and 160 E. and 80 S has been chosen for determining the glaciclogical regime and processes, and deducting some of the history and future, of a sizeable part of the East Antarctic ice sheet. Broad aims of the program are to clarify the relationships among the size, shape and glaciological regime of the ice sheet; to reconstruct various stages of its development, their causes, and their effects on the atmosphere and the world ocean; to assess the relationships between the ice sheet and changes in climatic conditions; to determine any changes in size and regime taking place at the present time; and to trace events of human and natural origin recorded in the ice.

A-10054
Kanaev, V.F. , Neiman, V.G.
STUDIES OF THE INDIAN OCEAN. A SYMPOSIUM IN INDIA. Izuchenie Indiiskogo okeana. Simpozium v Indii. Akademiia nauk SSSR. Vestnik, July 1971 41(7), p.105-109, In Russian.

The second symposium on the Studies of the Indian Ocean was organized by the Marine Biological Association of India together with other international organizations and held in Cochin, India, Jan. 12-18, 1971. Scientists from India, Australia, Gr. Britain, the USSR, the US, France, Japan, and other countries attending the symposium presented 400 scientific papers, which covered broad subject areas on the origin, resources, and other oceanographic studies in the Indian Ocean, including the southern part of the ocean. A new geological and geographical atlas of the ocean will be published reflecting data presented at the symposium.

A-10077
British Antarctic Survey
ANNUAL REPORT. British Antarctic Survey bulletin, June, 1971 No.24, p.121-248, 55 refs.
QH84.2.B72

The annual relief of the Survey's Antarctic stations was carried out, more or less according to plan, in spite of renewed volcanic activity at Deception I. in Feb. 1969 which necessitated evacuation of the island, and stern stuffing box trouble on R.R.S. John Biscoe which necessitated the ship going into dry dock early in the season. During the period 1968-69 a joint British-American project in which British surveyors and geologists were transported to the Shackleton Range by a U.S. Navy C130 aircraft to establish ground control for existing American air photography was successfully carried out, and plans were made to replace R.R.S. Shackleton with a new ship and to reopen a station on South Georgia to replace the Government Administration at King Edward Point. Research activities conducted in the following scientific disciplines are described: botany, zoology, veterinary investigations, medicine and human physiology, survey and mapping, geology, geophysics, and glaciology. A highlight of the year was the second Symposium on Antarctic Ecology, held at the Scott Polar Research Inst., Cambridge, during July 29-Aug. 3, 1968 (see B-8120 and B-8534).

A-10078
Special Committee of the International Geophysical Year
ANNALS OF THE INTERNATIONAL GEOPHYSICAL YEAR. VOLUME 44. ANTARCTICA. Oxford, Pergamon Press, 1967, 201 p., Refs.
QC801.3.S6

This volume contains information on the techniques and results of concentrated scientific efforts carried out in the Antarctic during the IGY in various fields. Nine papers cover: the effects of the IGY on the progress of research and exploration in the Antarctic; biology; cartography; geology; inter-relationship between the upper atmospheric and geomagnetic disturbances in Antarctica; inter-relationship between meteorology, oceanography and glaciology in Antarctic studies; continental structure of Antarctica; development of techniques of logistic support for expeditionary activities; and communications network in the Antarctic. Three appendices list pre-IGY geographical and scientific expeditions to the Antarctic and Subantarctic; scientific stations in the Subantarctic and Antarctic; and organization of national activities in the Antarctic during the IGY. Also included is a list of IGY stations in Antarctica and Subantarctic islands. For abstracts of pertinent papers see A-10079, B-10080, C-10081, E-10082, K-10083, I-10084, L-10085, and G-10086-10087.

A-10079
Gould, L.M.
EFFECTS OF THE IGY ON THE PROGRESS OF RESEARCH AND EXPLORATION IN THE ANTARCTIC. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.1-6
QC801.3.S6

In addition to diminishing great gaps in our knowledge the outstanding success of Antarctic research during the IGY has created a requirement for much additional information on the polar regions. The attainment of the research goals of the IGY is a tribute to the international coordination of the programs which was a primary responsibility of the CSAGI Antarctic Committee. Notable advances in the fields of biology, cartography, geology, and logistics, as well as in the understanding of the inter-relationships between certain other disciplines are reviewed. The results of the IGY may be seen in: the several international symposia held on Antarctic research to report on a number of different scientific disciplines; continuance of the World Data Centers on a voluntary basis; continued collaboration by most of the nations involved in Antarctic research; the establishment of SCAR; and the development of the Antarctic Treaty.

A-10094
Peterson, R.T.
EXPLORING ANTARCTICA. International wildlife, Nov.-Dec. 1971 1(6), p.28-35
S690.I55

An account is given of the author's sixth voyage to the Antarctic. The attractions of the tour included icebergs, penguins, albatrosses, seals, and a dog team. The barrack-type buildings of McMurdo were found to be quite impersonal in comparison to the simple, lived-in huts of Shackleton and Scott. The early decimation of wildlife at Macquarie I. has given way to a reassuring growth in the population of elephant seals, fur seals, and king penguins. The old whaling port of Grytviken at South Georgia has become a ghost town due to the decline of the whaling industry. The large accumulations of refuse noted along the waterfront of McMurdo and along the beaches of smaller bases such as Cape Hallett suggest that waste disposal will become the primary problem of any future colonization of the Antarctic

continent. Despite the disposal problems the continent is a unique experiment in international cooperation and guidelines for conservation are contained in the Antarctic Treaty.

A-10104
Moore, G.
TO ANTARCTICA BY SEA. Pacific discovery, July-Aug. 1968 21(4), p. 10-15
Q1.P15
A popular account is given of a tourist trip from New Zealand to Antarctica aboard the Magga Dan in Jan.-Feb. 1968. Rarely-visited sub-Antarctic islands, scientific stations, animals, and birds seem during the voyage are described briefly.

A-10113
Villiers, A.
THAT EXTRAORDINARY SEA GENIUS, CAPTAIN JAMES COOK. Nutrition today, Autumn 1969 4(3), p.8-16
Capt. James Cook, Royal Navy, an outstanding explorer, astronomer, navigator, and cartographer, was the first man to circumnavigate the Antarctic continent. In addition to these achievements, he was the first northern seaman to defeat scurvy. At the time Cook volunteered for the Navy in 1755, scurvy was an inevitable sea risk, and numbers of men died from it. Capt. Cook knew from experience that fresh foods, abundant fresh water, and sensible living habits kept scurvy out of coastal and short-voyage ships, and believed that the same rules should apply to deep-sea ships on long voyages. For his successful fight against scurvy, he was awarded Britain's highest honor for intellectual achievement, the Copley Gold Medal.

A-10114
Priestley, R.
INEXPRESSIBLE ISLAND. Nutrition today, Autumn 1969 4(3), p.18-27
An account is given of the survival of Capt. Robert Scott's Northern Party comprised of 5 Navy men and a civilian, including the author, who were unintentionally abandoned on Inexpressible I. for a year with only a 6-wk supply of sledging rations plus a small emergency food store of pemmican, sugar, cocoa, chocolate, biscuits, and bouillon cubes. This meager diet was supplemented with the meat, fat, blood, and various organs of seals and penguins. Heat and light for the 12-ft x 9-ft x 5-ft cave dug by the men in the snow and ice was furnished by the blubber from the animals killed. Dreams of food and rescue, and small celebrations with treats became important features in the lives of the men. After their rescue, the men learned that Capt. Scott and his Southern Party had perished on the Ross Ice Shelf.

A-10125
Selezneva, E.S. , Voskresenskii, A.I.
ISAAK MARKOVICH DOLGIN (ON HIS 60TH BIRTHDAY). Isaak Markovich Dolgin (k 60-letiiu so dnia rozhdeniia. Meteorologiia i gidrologiia, Dec. 1970 No. 12, p.109-110, In Russian.
QC851.M27
The life is described of I.M. Dolgin, Ph.D. in Geographical Sciences, who participated in several Arctic experiditions and has been in charge of the Meteorological Section in the Arctic and Antarctic Scientific Research Institute since 1956. In 1940 Dolgin studied the upper-air structure in the Antarctic. He directed much of his effort toward organizing aerological networks supplied with appropriate equipment in the Arctic and Antarctic. He published 80 scientific works on the free atmosphere in the polar regions. Dolgin has been awarded many decorations for his achievements.

A-10141
Kotliakov, V.M.
FIRST MEETING OF THE COORDINATIVE COUNCIL OF THE INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT (IAGP). Pervoe soveshchanie Koordinatsionnogo soveta Mezhdunarodnogo antarkticheskogo gliatsiologicheskogo proekta (MAGP). Akademiia nauk SSSR. Vestnik, Oct. 1970 40(10), p.115-116, In Russian
AS262.A627
Activities of the first meeting of the IAGP Coordinative Council, held in Paris from May 26 to 28, 1970, are briefly reported. Scientific programs carried out in the Antarctic by Australia, the USSR, the US and France are discussed, and plans for future research are outlined. A document "Organization and methods of IAGP work" was adopted at the meeting. It is resolved that surveys shall be expanded from the present area comprising East Antarctica from the top of the ice cap to the sea shore between 60 and 160 E, to include the western part of the Ross Ice Shelf and the Lambert Glacier. The next meeting of the council was set for Aug. 1971 in Moscow during the 15th Assembly of the IUGG.

A-10167
Losev, K.S.
SYMPOSIUM ON GLACIAL HYDROLOGY. Simpozium po gidrologii lednikov. Zemlia i vselennaia, Mar.-Apr. 1970 No.2, p.70-71, In Russian.
QB1.Z47
A brief review is presented of the Symposium on Glacial Hydrology which was organized by the International Association of Scientific Hydrology and the Glaciological Society in Cambridge, England, in the fall of 1969. About 38 papers, 8 of which were from the USSR, dealt with water balance of glaciers, glacier flow, artificial influence on glaciers, and icebergs as a source of fresh water. The main topic of the symposium was mathematical modeling: glaciers were analyzed as water reservoirs with seasonal and diurnal discharge control. After-meeting activities of the participants in England are reported.

A-10169
Milovidov, E.V.
SESQUICENTENNIAL OF THE DISCOVERY OF ANTACTICA. 150-letie otkrytiia Antarktidy. Zemlia i vselennaia, July-Aug. 1970 No.4, p.74-77, In Russian
QB1.Z47
Fifteen postage stamps (a small part of those available) issued since 1907 in commemoration of Antarctic exploration by New Zealand, Great Britain, the USSR, the US, France, Belgium, Argentina, Australia and Japan, are reproduced and described.

A-10192
Orlov, V.A.
SOVIET STAMPS COMMEMORATING ANTARCTIC EXPLORATION. Sovetskie marki ob issledovaniiakh Antarktidy. Zemlia i vselennaia, July-Aug. 1967 No.4, p.89-90, In Russian
QB1.Z47
Postage stamps (10 of which are reproduced)

issued by the USSR between 1950 and 1966 in commemoration of Antarctica are described. The series of stamps issued during the 17-year period reflect important events related to Antarctic exploration, such as Antarctic discoveries, the first voyage of the Ob' to the Antarctic, organization of the Soviet Antarctic Expeditions, establishment of new Antarctic stations, and other scientific activities.

A-10278
Owen, T.B.
U.S. ANTARCTIC RESEARCH PROGRAM, 1970-1971; REVIEW OF YEAR-ROUND AND STATESIDE ACTIVITIES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.151-153

This issue of the Antarctic Journal constitutes the second part of the annual review of the United States' program in Antarctica. Reported here are year-round observations made at Antarctic stations and aboard the research vessels Eltanin and Hero, and research and data analysis accomplished at laboratories in the U.S.A. In the past, stateside services rendered in support of the United States Antarctic Research Program also have been reported in the Sept.-Oct. issue, but lack of space this year has forced postponement of these articles to the Nov.-Dec. issue. The first part of the annual review, which comprised the July-Aug. issue (A-9900), described field activities that took place over the past austral summer. Two major events of the year were the observance of the 10th anniversary of the Antarctic Treaty on June 23, 1971, and the implementation of the President's pronouncement to consolidate funding and management responsibilities of the U.S. Antarctic program in the National Science Foundation. The new alinement of responsibility, as stated in Circular A-51 (Revised), issued by the Office of Management and Budget on Aug. 4, 1971, is presented. For abstracts of papers on the Antarctic research program see: E-10279 to 10288; E-10302 to 10333; G-10349; I-10334 to 10337; J-10289 to 10301, 10348; K-10338 to 10344; L-10345 to 10347.

A-10350
Sandved, K.G. ed
U.S. ANTARCTIC FIELD ACTIVITIES, 1971-1972. Antarctic Journal of the United States, Nov.-Dec. 1971 6(6), p.237-247

The Year's field activities began on Aug. 31 with an early-season airlift from Christchurch to McMurdo Station. Regular, full-fledged operations began on Oct. 7, when two LC-130s inaugurated the airlift between New Zealand and McMurdo that will last through Feb. The closing of Byrd Station after 15 years of operation and the start of construction of a new station at the South Pole leaves the U.S. with only 3 "permanent" stations, not counting Siple Station, which becomes a year-round station this winter. Activities in the international projects, research in the McMurdo Sound Area, studies at the several stations and on the Antarctic Peninsula are summarized. Air and ship operations and construction and maintenance work are described.

A-10351
DeGoes, L.
RECENT ACTIVITIES OF THE COMMITTEE ON POLAR RESEARCH. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.248-249

In international activities, the Committee chairman presided over the 11th meeting of SCAR, held in Oslo, Aug. 1970 and also served as U.S. delegate to the plenary sessions. SCAR and the IUGS cosponsored a second symposium on antarctic geology and solid earth geophysics, held in Oslo, Aug. 1970. In domestic activities, the Committee report, Polar Research--A Survey, reviewed results of past polar research, assessed future research, and made recommendations. The several panels of the Committee discussed research programs in biomedicine, biology, mapping of Antarctica, the Ross Ice Shelf Project and the Dry Valley Drilling Project. Other activities included Committee sponsorship of participation in the International Sea Ice Conference, held in Iceland in May.

A-10352
Alberts, F.G.
ANTARCTIC NAMES PROGRAM. Antarctic Journal of the United States, Nov.-Dec. 1971 6(6), p.249

In the past year the Geographic Names Division (GND), U.S. Army Topographic Command, in an ongoing program correlative of the U.S. and multinational scientific investigation of Antarctica carried out activities and services in the following fields: 1) New nomenclature. Two hundred and eighty-seven new names for antarctic geographic features were established, and five names were amended. GND researched all the names and performed other staff functions for the Advisory Committee on Antarctic Names. 2) Inquiries and related services. GND processed name inquiries concerning Antarctica, edited manuscript reports and maps for correct use of standard names prior to publication, and supported the Geological Survey in its preparation of topographic and geologic maps of Antarctica. 3) Names file maintenance. GND maintains a geographic names file for Antarctica as part of its worldwide central names file which contains nearly 11,000 approved names for Antarctica, approximately 800 of these approved following publicaton of Board on Geographic Names Gazetteer No.14, Antarctica, 3d Edition, 1969. 4) Gazetteer preparation. Work has gone forward in the preparation of materials for a cumulative gazetteer with full descriptive text in the format of the 1956 Board on Geographic Names gazetteer. Completion of this work is expected in 1972.

A-10353
Thuronyi, G.T.
CONTINUING BIBLIOGRAPHIC CONTROL OF ANTARCTIC LITERATURE. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.249-250

For 8 years the Cold Regions Bibliography Section in the Science and Technology Division, Library of Congress, has been collecting antarctic literature worldwide. Coverage of current literature (published in 1962 or later) has now reached well over 9,000 items. All documents found are microcopied, abstracted, and indexed. File cards containing the citation, abstract, Universal Decimal Classification number, and index terms are mailed regularly to the Office of Polar Programs of the National Science Foundation and to other qualified recipients. The abstracts are also published in book form in cumulations of 2,000 items, with author, subject, geographic, and grantee indexes. The last volume to date, Antarctic Bibliography Vol. 4, was issued in June 1971. References to some 5000 items published from 1951 to 1961 are included in a retrospective volume, Antarctic Bibliography 1951-1961, issued in 1970, bringing the total number of items under bibliographic control to more than 14,000.

A-10354
Fehlmann, H.A.
USARP ACTIVITIES AT THE SMITHSONIAN OCEANOGRAPHIC SORTING CENTER. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.250-251

The Smithsonian Oceanographic Sorting Center (SOSC) has worked on a cooperative basis with the U.S. Antarctic Research Program for 7 1/2 years and has sorted in excess of 17 million specimens. From May 1, 1970, through March 1971, 244 biological samples were received by SOSC from USARP. All of these samples have been sorted, and most of the resulting specimens have been dispatched in 48 shipments. Activities this year included the filming at Cape Crozier of the predation by the leopard seal on Adelie penguins, along with the opportunistic feeding of south polar skuas on the freshly killed penguins. Approximately 180 gallons of plant specimens, invertebrates, and fishes taken at Tierra del Fuego and Staten I. during Hero Cruise 71-2 are being sorted currently by the Center for distribution to specialists.

A-10355
Simkin, T.
ROCKS FROM THE ANTARCTIC SEAS. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.251

The geology section of the Smithsonian Oceanographic Sorting Center receives, inventories, and distributes rocks recovered in the Eltanin sampling program. Two years ago nearly 1,400 kg of rock specimens that had been stored at the Florida State University core storage facility were received and last November an equal quantity was received that included iron-manganese concretions and some of the more interesting rocks in the Eltanin collection. Additional specimens arrived from the biological sampling program and, as in the case of Eltanin Cruise 45, from individual geologists aboard specifically to dredge oceanic rocks. Two computer programs handle sample data. The first includes whole sample data plus the different numbering, location, and depth information gathered by the several different groups dealing with each sample. The second program catalogs and cross-references lithologies, physiographic settings, and petrographic features of all rocks described under the petrographic microscope.

A-10356
Landrum, B.J.
DOCUMENTATION OF U.S. ANTARCTIC COLLECTIONS. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.251-252

Through the Antarctic Records Program at the Smithsonian Oceanographic Sorting Center (SOSC), electronic data processing (EDP) techniques have been applied to storage and retrieval of data on natural-history specimens and to establishing a centralized inventory of antarctic collections and related data. The growing inventory of samples now contains some 87,000 unit records, primarily from sorting data on Eltanin benthos and plankton samples. During the year a species inventory has been established which is now comprised of about 8,000 records on USARP, Deep Freeze, and Windmill species that are referred to about 13 major taxonomic groups. These files will eventually contain records on all specimens collected by U.S. investigators. The Office of Polar Programs, National Science Foundation has approved the use of standardized forms for data recording and supplied such forms to Eltanin, Glacier, and Hero to examine the possibilities of routinely using the EDP facilities on board for recording basic sampling data.

A-10357
Frakes, L.A.
ISAMSED, A COMPUTER PROGRAM FOR DESCRIPTION OF SEDIMENT CORES. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.252-253

At the Antarctic Marine Geology Research Facility in the Department of Geology, Florida State University, sediment cores taken by the USNS Eltanin are routinely described to make basic information available to researchers in this country and abroad. Cores are described by megascopic and microscopic examination and then by checking items listed on a description sheet. The data are then easily transcribed to Fortran sheets, punched on cards, and submitted with a newly documented program, ISAMSED, to the computer on campus. Output is in abbreviated form to allow more data per page, and the sheets are photographed directly for publication. The program contains a provision to allow treatment of Phleger cores as well as dredge and grab samples.

A-10367
Rue, A.E. de la
REMNANTS OF THE PAST ON KERGUELEN ISLANDS. Aux Îles Kerguelen; témoignages du passé. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan-June 1970 No. 50-51, p.25-40, In French.

The history of the Kerguelen Is., since their discovery by the Breton Yves de Kerguelen, is a loose succession of temporary occupations by whalers, sealers, scientific expeditions and (on two occassions) sheep raisers. An outline of this history is given, and visible traces of it - tombs, ruins of buildings, abandoned campsites, wreckages, pieces of metal, carcasses of whales and seals, etc. - are described and shown in photographs. The objects photographed include a kettle for melting oil, and a press for obtaining oil from penguins. A new era began for the Islands with the installation of a permanent station at Port-aux-Francais in 1950.

A-10379
Loewe, F.
ALFRED WEGENER - HIS LIFE AND WORK. Australian meteorological magazine, Dec. 1970 18(4), p.177-190, 14 refs.

Alfred Wegener will mainly be remembered for his explorations of Greenland and the first determinations of the thickness and structure of the Greenland ice sheet, his contributions to the field of atmospheric research, including a comprehensive textbook "Physics of the Atmosphere", and his discovery of continental drift. His book "Origin of the Continents and Oceans" which appeared in four editions between 1915 and 1928, gives all the geodetic, geophysical, geological, and paleontological arguments for his theory on continental drift which was not generally accepted. In the last 2 yr the existence of Gondwanaland and with it the drift of the southern continents has been strikingly confirmed by the discovery in the Transantarctic Mountains of numerous remnants of triassic tetrapod animals which were previously found in southern India, South Africa, and other parts of Gondwanaland. Reconstructions of the former positions of the continental land masses, based on the study of rock magnetism, conform well to the positions given by Wegener for the

different geological periods. Alfred Wegener died in Greenland during an expedition in 1930-31.

A-10422
Müller-Schwarze, D. , Müller-Schwarze, C.
WILSON'S STONE HUT AT CAPE CROZIER. Antarctic journal of the United States, Jan.-Feb. 1972 7(1), p.15-17, 1 ref.

Extracts are given from Edward A. Wilson's Draft Report of the Winter Journey from Cape Crozier, 27 June to 1 August 1911. During the British Antarctic ("Terra Nova") Expedition 1910-13, Leader R.F. Scott, which describe attempts to collect egg speciments at the Emperor penguin rookery and the building of Wilson's hut. On Jan. 18, 1971, 60 years after the above journey, the authors inspected the site and suggest that Wilson's hut at Cape Crozier be protected and officially declared a historical site.

A-10423
Parker, B.C.
COLLOQUIUM ON ANTARCTIC CONSERVATION AT VIRGINIA POLYTECHNIC INSTITUTE. Antarctic journal of the United States, Jan.-Feb. 1972 7(1), p.17-18

The colloquium on conservation problems in Antarctica held at the Virginia Polytechnic Institute and State University Sept. 9-11, 1971, at Blacksburg, is the first to bring together U.S. Antarctic Research Program workers for this sole objective. It has become obvious that the Agreed Measures for the Conservation of Antarctic Fauna and Flora (Antarctic Treaty) will require considerable revision and expansion based upon the modern ecosystem interaction concept. Discussions of these problems and some probable solutions will be published in the colloquium proceedings early in 1972. Papers given at the colloquium are briefly summarized.

A-10424
Sandved, K.G.
U.S. ANTARCTIC PROGRAM FIELD ACTIVITIES OCTOBER-NOVEMBER 1971. Antarctic journal of the United States, Jan.-Feb. 1972 7(1), p.19-24

The continuations and primary results are described of the various programs, operations, flights, and logistics pertaining to the Antarctic Peninsula, McMurdo Sound area, Hallett, Amundsen-Scott, and Byrd Stations. Air operations and construction and maintenance projects are further described. The International Antarctic Glaciological Project is about ten days behind schedule. Year-round occupancy of Siple Station has been deferred for one year. An LC-130 crashed on take-off from the polar plateau due to separation of JATO bottles. The U.S. exchange scientist at Vostok Station continued upper-atmosphere studies.

A-10451
PHILATELIC MAIL FOR ANTARCTICA. Antarctic, June 1971 6(2), p.50

Stamp collectors may have covers postmarked at two United States bases in the Antarctic and aboard three United States Coast Guard icebreakers working with the United States Navy. Collectors are limited to one cover each from McMurdo and Amundsen-Scott stations, plus one cover each from the Staten Island, Southwind, and Northwind. Philatelic mail to be postmarked in Antarctica must reach the Navy's collecting point at Davisville, R.I., not later than Sept. 1, 1971, in order to be processed by the winter parties. The procedures for the submission of covers by collectors for cancellation are enumerated.

A-10452
NO CONCESSIONS TO ANTARCTIC TOURISTS. Antarctic, June 1971 6(2), p.51

Antarctica makes no concessions to tourists. They can encounter incredibly rough seas in southern latitudes, icy cold winds, low temperatures, and gales on the continent itself. An Australian tourist, who found that the Antarctic was not a tourists' paradise when she joined the other 70 passengers of the second expedition of the Lindblad Explorer in Feb. 1971, describes her trip.

A-10454
Satterthwaite, C.A.
FIRST VISIT TO ANTARCTICA BY A SUMMER CARETAKER. Antarctic, June 1971 6(2), p.59-60

In the summer of 1969 the Antarctic Division, New Zealand Department of Scientific and Industrial Research, decided to appoint caretakers to spend a few weeks at McMurdo Sound during the peak of the season for summer visitors and tourists. Their job was to carry out minor maintenance to the two historic huts at Capes Royds and Evans, and to guide visitors through the penguin rookery at Cape Royds. The author, appointed one of two caretakers for the period Nov. 27 - Dec. 20, 1970, describes the quiet beauty of Antarctica, the huts, still containing the furnishings and personal effects of legendary explorers, and surrounding terrain. In addition to other jobs, the penguin rookery was surveyed and placarded and hours were spent studying the mating and nesting behavior of the birds.

A-10455
ANARE TO HAVE UNMANNED GEOPHYSICAL STATION. Antarctic, June 1971 6(2), p.61-62

A prototype of an unmanned geophysical observatory designed by the Antarctic Division has been installed 60 mi south of Casey Station and is being tested in the field for the first time. Data are recorded on magnetic tape and photographic film, and the equipment is required to operate unattended for up to 1 yr. The 3 components of the earth's magnetic field, micropulsations in the earth's field, ionospheric electron density measured by riometer, all-sky photography of the aurora, and micrometeorological data will be recorded throughout the year. Work has begun on housing a sensitive cosmic ray telescope and seismic instrumentation underground. Scientific studies being conducted at Mawson, Davis, Casey, and Macquarie I. are summarized.

A-10456
Jones, A.G.E.
NEW VOYAGE TO THE SOUTH SHETLANDS IN 1819-20. Antarctic, June 1971 6(2), p.63-66, 12 refs.

An account is given of a previously undescribed voyage to the South Shetland Is., the landing on one of them, and the taking possession of the group a month before they were formally annexed to Great Britain by Edward Bransfield in 1820. Capt. William Smith discovered the New South Shetlands on Feb. 19, 1819, and news of his discovery was published on May 2 and July 20, 1820. Joseph Herring's account however, dated July 3, 1820, is the first reasonably full report of the newly-discovered land. Mr. Herring's party landed on one of the group of barren

islands on Dec. 25, 1819 and hoisted the British flag. They found countless multitudes of seals, many gulls and a species of very large tame bird (doubtless the penguin). The seals, which were the object of the voyage were killed in vast numbers and the skins sold at Buenos Aires at a very low rate. Disclosure of the discovery in Liverpool brought numbers of ship-owners and merchants to the islands for seal skins.

A-10458
WILSON DRAWING AND BYRD DOG SLEDGE. Antarctic, June 1971 6(2), p.68

What appears to be an original wash drawing by Dr. Edward A. Wilson of a view of Hut Point from Observation Hill, dated Apr. 1, 1911, has been lent to the Canterbury Museum by Dr. G.M. Gray of the University of Canterbury. Another dog sledge has been added to the museum's collection, which was used for training dogs in the Mount Cook area by Capt. Alan Innes-Taylor, of Rear Admiral Richard E. Byrd's first and second expeditions in 1928-30 and 1933-35. A short history of the dogs used on these expeditions is included.

A-10466
Robin, G. de Q.
THIRTY-SIXTH ANNUAL REPORT ON THE WORK OF THE SCOTT POLAR RESEARCH INSTITUTE. Polar record, May 1963 11(74), p.664-673, Also: 37th, Ibid., Sept. 1964, 12(78) p.375-381; 38th, May 1965, 12(80) p.671-678; 39th, May 1966, 13(83) p.263-271; 40th, Sept. 1967, 13(87) p.853-860; 41st, Sept. 1968, 14(90) p.401-408 and 42nd, Sept. 1969, 14(93) p.905-914. Also issued as separates.
G575.P6; G575.S35

The work of the institute is reported for the annual period from October to September. Data are given on personnel, teaching and research activities, library and information services, financial activities, and acquisitions by gift or exchange. Research continued in the various disciplines, and historical studies, including (in the Antarctic) distribution variations and wave propagation in sea ice; temperature, thickness, and movement of ice; effects of swells and oceanic tides; radio echo sounding of the ice sheet; deformation of ice shelves; soil, vegetation and land fauna; and compilation of history and place names and guide to ornithology. Lists of publications by the staff and research students are included.

A-10467
Suziumov, E.M.
DOUGLAS MAWSON AND THE ANTARCTIC. Douglas Mouson i Antarktika. Leningrad, Gidrometeoizdat, 1970, 215p., In Russian. Refs. p.211-215

A popular account of the life of Douglas Mawson (1882-1958), an Australian scientist and explorer of the Antarctic, is given. Participating in several Antarctic expeditions, Mawson made magnetic and cartographic determinations of the coast and plateau of East Antarctica, as well as significant oceanographic discoveries in the region of the Crozet, Kerguelen, and Heard Is. Mawson discovered and recommended the area where Mawson Station now stands for a scientific station. He received many honors and was the author of numerous books and articles. In addition to Mawson's biography, geographic discovery and scientific research in East Antarctica during the last 100 yrs are described.

A-10469
Shcherbakov, D.I.
NEW DATA ON THE ICE CONTINENT. Novoe o ledianom materike. Nauka i chelovechestvo, 1963, p.199-211, In Russian

A popular account is given on studies of geography, cartography, glaciology, geology, meterology biology, and atmospheric physics carried out by Russian scientists in the Antarctic since 1947. The Antarctic Treaty and exchange programs provided a means for international cooperation.

A-10471
Panzarini, R.
SCIENTIFIC IMPORTANCE OF THE ANTARCTIC. Nauchnoe znachenie Antaktiki. Nauka i chelovechestvo, 1965, publ. 1965, p.176-185, In Russian

Scientific work carried out by various countries in the Antarctic is reviewed. The universal importance of Antarctic studies is discussed, and the roles of UNESCO and of Antarctic Treaty Signatories in the development of research programs are briefly described.

A-10496
Splettstoesser, J.F.
POLAR STUDIES. Geotimes, Jan. 1972 17(1), p.23-24
QE1.G56

Activities and research in the Polar regions, especially in earth sciences, are reviewed for the 1971 calendar year. The Office of Polar Programs at NSF is the prime coordinating and funding office for all U.S. research in Antarctica and much of it in the Arctic. The 1972 Fiscal Year budget for OPP is about 30 million: 7.5 for Antarctic research, 19 for associated logistic support, and 3.5 for Arctic research. Significant current projects in Antarctica include the Dry Valley Drilling Project and the International Antarctic Glaciological Project. The Ross Ice Shelf Project is still in the planning stages. Arctic programs include Arctic Ice Dynamics Joint Experiment and the Tundra Biome Program. (Auth.)

A-10499
Leningrad. Universitet
PROMINENT OCEANOGRAPHER AND POLAR EXPLORER (ON THE 60TH BIRTHDAY OF VIKTOR KHARLAMPIEVICH BUINITSKII). Vidnyi okeanolog i poliarnyi issledovatel' (k 60-letiiu so dnia rozhdeniia Viktora Kharlampievicha Buinitskogo. Leningrad. Universitet. Vestnik. Seriia geologii i geografii, Dec. 1971 24(4), p.155-156, In Russian.

The life of V.Kh. Buinitskii, Ph.D. in the Geographical Sciences, who participated in many Arctic and Antarctic expeditions, is described. Since 1950, as head of the Oceanographic Dept. in the Leningrad University, Buinitskii has been working on the research problems of the south polar region. He was the first to publish data on floral and faunal effects on the structure, texture, and physical and chemical properties of sea ice. Buinitskii is still active in scientific work and organizational activities.

A-10501
Bertrand, K.J.
AMERICANS IN ANTARCTICA 1775-1948. Special publication No. 39, New York, American Geographical Society, 1971, 554p., Refs.
G870.B44

American activities in the Antarctic since

the first sealing voyages in 1775 on the Falkland Is. to Operation Windmill in 1947-48, are presented in 24 chapters: (1) Introduction; (2) Early American sealers in the Antarctic; (3) The voyage of the Hersilia, 1819-1820; (4) The Fanning-Pendleton Sealing Fleet, 1820-1821; (5) The sealing expedition of the Huron and the Huntress, 1820-1821; (6) Other American sealing fleets at the South Shetlands, 1820-1821; (7) The Fanning-Pendleton Sealing Fleet, 1821-1822; (8) Captain Benjamin Morrell and the voyage of the Wasp, 1822-1823; (9) James Eights and the Palmer-Pendleton Expedition of 1829-1831; (10) The United States Exploring Expedition, 1838-1842; (11) Maury and Smyley, scientist and sealer in mid-century; (12) Voyage of the bark Oriental and the discovery of Heard Island by Captain John J. Heard, 1853; (13) New London sealers on Heard Island; (14) The United States transit of Venus Expedition to Kerguelen Island; (15) Robert Cushman Murphy's voyage in the brig Daisy; (16) The beginning of the mechanical age in Antarctic exploration; (17) The First Byrd Antarctic Expedition, 1928-30; (18) The Second Byrd Antarctic Expedition 1933-1935; (19) Ellsworth's Transantarctic flight, 1935; (20) The Ellsworth Antarctic Expedition, 1938-1939; (21) The United States Antarctic Service Expedition, 1939-1941; (22) The U.S. Navy Antarctic Development Project, "Operation Highjump," 1946-1947; (23) The Ronne Antarctic Research Expedition, 1947-1948; and (24) The U.S. Navy Second Antarctic Development Project, "Operation Windmill," 1947-1948.

A-10544
National Academy of Sciences, Washington, D.C. Committee on Polar Research
REPORT ON UNITED STATES ANTARCTIC RESEARCH ACTIVITIES, 1970-1971; UNITED STATES ANTARCTIC RESEARCH ACTIVITIES PLANNED FOR 1971-1972. National Academy of Sciences-National Research Council. Report, July 1971 No.13, 80p., 342 refs.

Summaries are given of U.S. Antarctic activities from Feb. 1970 to March 1971 in the atmospheric, earth, and biological sciences. Research vessel observations and operations of the Eltanin, Hero, Alpha Helix, and Burton Island are included in the cruises tabulated. Information activities of Polar Information Service of the Office of Polar Programs are outlined. Activities in progress during March to Oct. 1971 and activities planned for Oct. 1971 through Sept. 1972 are listed. Subcenters of World Data Center A, U.S. Stations and Scientific Personnel, and U.S. membership of the Committee on Polar Research and SCAR working groups are also listed. A bibliography is given of selected publications on U.S. Antarctic research.

A-10545
POLAR PROGRAMS. U.S. National Science Foundation. Annual report, 1972(FY1971) 21st, p.41-42, NSF72-1

Q11.U82

Year-round research under the U.S. Antarctic Research Program continued at two coastal and two inland stations and aboard the ships Hero and Eltanin. During the increased activity of the austral summer of 1970-71, nearly 150 scientists and technicians pursued field investigations with the logistic support of the U.S. Naval Support Force, Antarctica, and icebreaker support by the U.S. Coast Guard. Research spanned many disciplines, with major participation by biologists, earth scientists, oceanographers, and atmospheric scientists.

A-10546
ANTARCTIC RESEARCH PROGRAMS. U.S. National Science Foundation. Grants and awards, 1972 (FY 1971), p.111-114, NSF 72-2

Q180.U5A343

The U.S. Antarctic Research Program is divided into 1) Science Programs, 2) Field Support, 3) Polar Information Service, and 4) Advisory Services. Under each of the above categories the listing is arranged by regional areas, i.e., states or other areas in the U.S. and other countries. In each region the institutional grantee is listed together with the name of the senior scientist or project leader, the project title, grant number, project duration, and amount of funds granted.

A-10547
Treshnikov, A.F.
ARCTIC AND ANTARCTIC INSTITUTE. Institut Arktiki i Antarktiki. Chelovek i stikhiia, 1966, p.14-15, In Russian. Also: A center of polar studies. (Tsentr poliarnykh issledovanii). Ibid. 1969, p.43-77.

QC851.C39

Activities of the Arctic Institute renamed in 1958 the Arctic and and Antarctic Scientific Institute are reviewed since its founding in 1920. The institute carries out oceanographic, meteorological, glaciological, hydrological, and ionospheric studies in the Arctic and Antarctic. The main goal of the institute is to improve the old and to find new methods for glaciological, meteorological and geophysical forecasting. The institute has published more than 400 volumes on its work, over 60 volumes of Soviet Antarctic expeditions and several hundreds of issues of periodicals, reference books, atlases, and other scientific manuals, including 2 volumes of the Antarctic Atlas.

A-10549
Gordienko, P.A.
IN THE ANTIPODAL COUNTRIES. V stranakh-antipodakh. Chelovek i stikhiia, 1966, p.144-145, In Russian.

QC851.C39

The similarities and differences between the Arctic and Antarctic regions are discussed. A comparison is made of water and land distributions around the Poles, locations of the Cold Poles, movement directions of the Sun and Moon, ice drift, wind regimes, seasons, and fauna.

A-10550
Treshnikov, A.F.
"UNKNOWN" ANTARCTICA. "Nevedomaia" zemlia Antarktida. Chelovek i stikhiia, 1966, p.162-163, In Russian.

QC851.C39

The history of Antarctic explorations by Soviet expeditions is briefly described. Since 1956 intensive investigations have been carried out in Antarctica in meteorology, glaciology, atmospheric and terrestrial physics, cartography, geology, and biology. On the basis of data obtained, the Antarctic Atlas was compiled and published in 1966. Further studies are suggested to continue accumulating additional knowledge of the Antarctic.

A-10556
Kuznetsov, M.A.
SIX POLES OF THE ICE CONTINENT. Shest' poliusov

ledianogo kontinenta. Chelovek i stikhiia, 1969, p.38-39, In Russian.
QC851.C39
At least six poles are located in Antarctica: Geographic, Magnetic, Relative Inaccessibility, Wind, and Cold poles. The first four have antipodes in the Northern Hemisphere, the location of which may be determined by mathematical calculation. These 4 poles have no fixed positions, the most mobile being the Magnetic Pole, which has moved 100 km in 10 yrs. The Dumont d'Urville wind pole region has had 340 days during some years with wind speeds of 15 m/sec and up. On May 15, 1912 and Feb. 22, 1951, the records show wind speeds of 45 m/sec and gusts of up to 100 m/sec. The Cold Pole or coldest region is in the vicinity of Vostok and Sovetskaya Stations and of the Pole of Inaccessibility, where the mean temperature is -56 C, compared to -49 C at the South Pole and -11 C at Mirnyy. Antarctica is also called the "ice" pole (88 percent of all continental ice concentrated in Antarctica) and the "desert" pole (combining greatest size, severe climate, and meager life).

A-10561
Scarf, M.
ANTARCTICA; EXPLORING THE FROZEN CONTINENT. New York, Random House, 1970, 83p.
A popular account is given of voyages since 1773, to Antarctica, through the pack ice around the continent, and inland as well, including Palmer's voyage in 1823, search for the South Magnetic Pole in 1841, and the race to the South Pole in 1911-12. Scientific explorations of the Antarctic made by ship, aircraft, and tractor are discussed.

A-10562
Zakhariev, V.
BULGARIAN IN ANTARCTICA. Bulgarin na Antarktida. Sofiia, Narodna Prosveta, 1971, 205p., In Bulgarian.
This book describes in general the following: a history of the discovery of Antarctica, the author's voyages to and from the Antarctic aboard the Professor Vize, an intracontinental flight to Vostok Station, scientific explorations carried out and results obtained during Zakhariev's stay on the continent. Zakhariev had joined the 13th Soviet Antarctic Expedition to Mirnyy Station in 1967 by invitation and was the first Bulgarian scientist in Antarctica.

A-10564
New Zealand. Department of Scientific and Industrial Research
REPORT...FOR THE YEAR ENDED 31 MARCH 1965. Wellington, R.E. Owen, Government Printer, 1965, 88p., Report H.34.
Q181.N75
The report of the Department of Scientific and Industrial Research includes summaries of upper atmosphere and nuclear studies dealing with radar observations of auroral ionization, gamma-ray spectroscopy, radioactivity from nuclear tests, and paleo-temperature studies. Activities of the Antarctic Division of D.S.I.R. are described at Scott Base, Hallett Station, Ross Dependency, McMurdo Ice Shelf, Balleny and Ross Is., onboard the Endeavour, and in logistical and operational control of non-governmental university projects. The seventh annual report of the Ross Dependency Research Committee covers the scientific program at Scott Base, Hallett Station, Government field expeditions, Victoria University of Wellington expedition, University of Canterbury biological program, Lincoln College soil studies, oceanographic surveys, inland expeditions, logistic support, and SCAR matters.

A-10565
New Zealand. Department of Scientific and Industrial Research
REPORT...FOR THE YEAR ENDED 31 MARCH 1964. Wellington, R.E. Owen, Governemnt Printer, 1964, 37p., Report H. 34.
Q181.N75
Account is given of the Dept. of Scientific and Industrial Research. Activities of the Antarctic Division of the D.S.I.R. are described. These continue the scientific program at Scott Base and Hallett Station, geological and survey mapping at the Ross Dependency, McMurdo Ice Shelf study, Endeavour's journeys, Balleny I. reconnaissance, and non-governmental university projects. The Ross Dependency Committee in its sixth annual report summarizes the station activities, government expeditions, Victoria University of Wellington Expeditions, University of Canterbury biological party, oceanographic and magnetic surveys, logistic support, SCAR matters.

A-10582
Neider, C. ed
ANTARCTICA. New York, Random House, 1972, 464p., 14 refs.
G870.N36
This book contains authentic accounts of life and exploration in the Antarctic Continent, written by the explorers themselves. In the introduction the editor describes his pilgrimage to Antarctica as a guest of the U.S. Navy. Following the introduction are narratives from the writing of James Cook, George Forster, Thaddeus Bellingshausen, James Weddell, Charles Wilkes, James Clark Ross, Roald Amundsen, Robert Falcon Scott, Ernest Shackleton, Herbert G. Ponting, Apsley Cherry-Gerrard, Richard E. Byrd, Paul Siple, and Edmund Hillary. Each narrative is preceded by short notes on the life and writing style of the explorer, written by the editor. Also included are a chronology of some important dates in the exploration of Antarctica and a list of sources.

A-10601
Treshnikov, A.F.
ARCTIC AND ANTARCTIC SCIENTIFIC RESEARCH INSTITUTE 50 YEARS OLD. Ordena Lenina Arkticheskomu i antarkticheskomu nauchno-issledovatel'skomu institutu --50 let. Problemy Arktiki i Antarktiki, 1970 No. 36-37, p. 5-18, In Russian.
The activities of the Arctic and Antarctic Scientific Research Institute, which has conducted polar studies for the past 50 years in geology, geography, oceanography, glaciology, meteorology, and biology, are summarized. Since 1958 the institute has conducted Antarctic research programs and the explorations and discoveries of 15 Soviet expeditions have provided continuing information in the various disciplines. Increased knowledge of the ocean depths, subglacial ridges, plateaus, troughs, coastal glaciers, bays, and islands has resulted in end products such as navigation and topographic charts for the Antarctic and the two-volume Antarctic Atlas. See also A-10547.

A-10611
New Zealand. Department of Scientific and Industrial Research
REPORT...FOR THE YEAR ENDED 31 MARCH 1967. Wellington, R.E. Owen, Govt. Printer, 1967, 96p.
Q181.N75

A summary of the activities of the various divisions of D.S.I.R. gives the work done at the station, facilities, projects engaged in, and logistical and operational control by the Antarctic Division of the non-governmental projects of Victoria University of Wellington, University of Canterbury and University of Otaga. The ninth annual report of the Ross Dependency Research Committee is included as an appendix and describes the scientific program and activities at Scott Base, the government field expeditions, the university studies, participation in cruises of the Endeavour and Eltanin and the logistical support furnished. Of interest as seafloor minerals, phosphorite nodules have been located between the Snares and Auckland Is. and extensive deposits of glauconite on the Chatham Rise and fine-grained calcium carbonate sands on the Campbell Plateau are widely distributed. Publications pertaining to New Zealand's work in the Antarctic are listed.

A-10612
New Zealand. Department of Scientific and Industrial Research
REPORT...FOR THE YEAR ENDED 31 MARCH 1970. Wellington, A.R. Shearer, Govt. Printer, 1970, 63p.
Q181.N75

The departmental report includes a tabulation of the grants paid to research and allied institutions and expenditures and staffing of the Antarctic Division and other divisions. Included in research reporting are a general survey of the Stewart I. soils; long-term ecological interactions between sheep, vegetation and albatrosses on Campbell I. (Sub-Antarctic Islands Reserves Committee jurisdiction); detection of DDT in the fat of seals or penguins from Antarctica; new rigs for faster drilling and deeper penetration; geochronology by K-Ar trace of rocks from Antarctica and the SW Pacific Ocean; and diffuse echo theory testing by radar in cooperation with the Australian Antarctic Division. The twelfth annual report of the Ross Dependency Research Committee deals with Scott Base, Vanda Station, and government and university field projects. The lists of publications previously listed in the annual report are to appear in a new publication, DSIR Research (Inf. Ser. No. 77)

A-10613
OPERATION DEEP FREEZE '67. Dallas, Taylor Pub. Co., 1967, 87p.
VA65.M57A5

This cruise book is a chronicle of the lives of 189 men during the tour of duty for 8 months on Operation Deep Freeze 1967. Photographs of the personnel, activities on board ship, and places visited accompany a brief summary of the 1967 operations of the U.S.S. Mills (DER 383).

A-10616
Dukert, J.M.
WORLD OF ICE. Lamp, 1971 53(2), p.1-5
HD9560.1.L3

A journalist visits Antarctica in the company of other journalists to observe the international scientific work in progress there. McMurdo Station, which has a summertime population of close to 1,000 personnel and which was originally built for the research studies carried out during the IGY of 1957-58, is now undergoing a form of urban renewal. Although many improvements have been added, water shortage is still a problem. The prefabricated buildings of the Amundsen-Scott South Pole Station are located 60 ft below the snow, providing a good seismic listening post for earthquakes. Research activities in Antarctica include studies in biology, cartography, geology, glaciology, meteorology, oceanography, physics, and climatology. In addition to its scientific resources the Antarctic continent is a land of great natural beauty and a new tourist attraction.

A-10618
NEW ZEALAND CURTAILS 1971-72 PROGRAMME. Antarctic, Sept. 1971 6(3), p. 74-75
G845.A55

New Zealand's Antarctic research program for 1971-72 has been slightly restricted because of reductions in national expenditure, and the return of H.M.N.Z.S. Endeavour to the United States. Royal New Zealand Air Force Hercules aircraft will make five support flights instead of the normal three between Nov. and Dec., but the extra flights will not make up for the loss of logistic support provided by the Endeavor. Only one party instead of four will be placed at Vanda Station. Three university expeditions will continue their research, but the programs of all have been trimmed. Details of the programs to be conducted at Scott Base, Vanda Station, Ross I., and Victoria, Waikato, and Canterbury universities are briefly described.

A-10619
MAJOR U.S. PROJECTS FOR SUMMER SEASON. Antarctic, Sept. 1971 6(3), p. 78-82
G845.A55

The closing of Byrd Station as a wintering facility and the establishment of Siple Station in Ellsworth Land as a winter and summer facility are two of the major projects in this season's program. Other major projects are a survey of prospective sites for the 1973-73 dry valley drilling program, an international effort involving scientists from the United States, Japan, New Zealand, and possibly other countries; a glaciological study near Byrd Station; and the remote sensing program, which includes radio sounding of ice thickness, airborne magnetometry, and aerial photography of seals and glaciers. Research will be conducted at six stations and aboard icebreakers in the Ross, Amundsen, and Bellingshausen Seas. The Eltanin will work in the Indian Ocean and Antarctic waters, and the Hero will continue to operate in the Antarctic Peninsula area from Palmer Station during the summer. The winter program at Pole, McMurdo, and Siple Stations will continue to concentrate on atmospheric science and the emphasis at Palmer Station will be on marine biology. Brief summaries of the scientific activities are given.

A-10630
SHACKLETON'S BIBLE RETURNS HOME AFTER MANY YEARS. Antarctic, Sept. 1971 6(3), p. 105
G845.A55

On Oct. 30, 1915, three days after Shackleton and his men had abandoned their ship, the Endurance, which was being crushed by the grinding pack ice, Shackleton threw away a Bible, a handfull of golden sovereigns, and a gold watch on the ice of the Weddell Sea. The men were beginning their march across the ice in an

attempt to reach safety 346 mi away. Shackleton had torn from the Bible the fly leaf, inscribed by Queen Alexandra, two pages from the Book of Job, and his favorite 23rd Psalm, all of which survived his journeys and are still treasured in his family. However, Shackleton never learned that the Bible was retrieved from the ice by a member of his expedition, Thomas F. McLeod. Early this year Cdr. M. K. Burley, leader of the 1970-71 Joint Services Expedition to Elephant I. was given the Bible after a talk at the British Embassy in Buenos Aires by Miss I. MacLean, whose parents had received it from McLeod in appreciation of their hospitality to him during his stay with them in Punta Arenas following the rescue of Shackleton's men from Elephant I. The Bible will be given to the Royal Geographical Society for safekeeping.

A-10636
SCAR WORKING GROUP ON OCEANOGRAPHY. Polar record, Sept. 1971 15(99), p.987
G575.P6

The Working Group on Oceanography met in Tokyo on Sept. 22, 1970 with the following agenda: Ross Ice Shelf Drilling Project - a group of specialists had been chosen; Pack ice - SCAR to consider an interdisciplinary symposium on polar pack ice in Sept. 1972; Intergovernmental Oceanographic Commission (IOC) Southern Ocean Coordination Group - comments on an agenda for a first meeting in Brussels, Nov. 1970; SCAR program in oceanography - Working Group on Biology to consider uniting the marine biology section with the biology section of the oceanographic program; and Future role of the Working Group - continue to function in a limited capacity and leave the promotion of Antarctic oceanography more to international oceanographic organizations.

A-10639
Ignatov, V.S.
WHERE IT'S COLDEST. Moscow, Progress Publishers, 1965, 137p., For Russian original see A-1995.

A popular account of research operations at Vostok Station in 1959-60 is given in three chapters: (1) A silent realm of ice; (2) Under the Southern Cross; and (3) Sunshine around the clock. Vostok Station is about half way between Mirnyy and the South Pole, is 3420 m above sea level, and has recorded the world's lowest temperature, -88.3 C.

A-10640
New Zealand. Department of Scientific and Industrial Research. Antarctic Division.
NEW ZEALAND ANTARCTIC RESEARCH PROGRAMME FOR 1966-1967. SCOTT BASE. Wellington, 1965, 16p.

This visitor's guide to Scott Station updates an earlier publication (See: A-3993). The history, planning, operation, manning, research facilities, dogs, and climate, of the station are described. Scientific studies of the ionospherics, whistlers, auroral physics, geomagnetism, Earth's electric currents, and seismology are reviewed. Quiet" Experimental Station establishment near Scott Station in 1964 records the ionospheric signals transmitted by the Polar Ionospheric Beacon Satellite 5-66. Scientific work at Hallett Station, Cape Royds, and Cape Bird is briefly discussed. The research program for the 1966-67 season covers studies in geology, glaciology, oceanography, and biology. Analyses of Antarctic snow, ice, and water continue for nuclear products occurring both naturally and as a result of nuclear explosions.

A-10645
Wilkes, D.
LAW FOR SPECIAL ENVIRONMENTS: ICE ISLANDS AND QUESTIONS RAISED BY THE T-3 CASE. Polar record, Jan. 1972 16(100). p.23-27, 11 refs.
G575.P6

Some unusual legal and international issues are raised by the case of United States vs Mario Escamilla, now Criminal Appeal No. 71-1575 for second-degree murder and involuntary manslaughter by reason of the fact that the research station, a drifting ice island T-3 (Fletcher's Ice Island), where the death occurred, existed and still exists in an environment not yet covered by law and for which it seems clear new law must be made. Seven jurisdictional issues are discussed and proposal made for the creation of an International Criminal court with optional jurisdiction over (among other matters) offences on, over, or under icebergs or floes north of the Arctic Circle or in Antarctica on both land and shelf ice.

A-10647
International Whaling Commission
TWENTY-THIRD MEETING OF THE INTERNATIONAL WHALING COMMISSION, 1971: ANTARCTIC WHALING. Polar record, Jan. 1972 16(100), p.73
G575.P6

The I.W.C. met in Washington, D.C. from June 21 to 25, 1971 and reported on the following: Antarctic catch, 1970-71 -- 6 expeditions operated in Antarctic waters, 3 Japanese and 3 Soviet, and caught 2890 Fin Whales, 6153 Sei Whales, (2470 blue whale units), and 2745 Sperm Whales, with a production of 470,287 barrels of oil. Antarctic catch limit, 1971-72 -- the catch limits for Fin and Sei whales was set at 2400 Blue Whale units. The limit for Sperm Whales remained the same. Abolition of the Blue Whale unit -- member countries agreed that the unit would be superceded by limits expressed by species in 1972-73. Scientific Committee report -- the committee was again unable to present an agreed figure for the maximum sustainable yield of Fin Whales; for Sei Whales in the Antarctic the yield was estimated as 5000 whales. Minke Whale stocks -- the U.S. delegation considered that a limit of 5000 should be set for the next Antarctic season. Observers on factory ships -- provisions were made for observers to be appointed by the commission and paid by the governments nominating them.

A-10648
INTERNATIONAL CONFERENCE ON THE BIOLOGY OF WHALES, 1971. Polar record, Jan. 1972 16(100), p.74-75
G575.P6

A conference on the biology of whales held at Skyland, Shenandoah National Park, Virginia from June 10-12, 1971 was organized and conducted by the IBP (International Biological Program) Marine Mammal Council. Papers on distribution and abundance of whales, biometrics and management, whale biology and natural history, and methods of observation and of tagging whales were delivered in general sessions. These papers provided a background for 3 working groups on Biology and Natural History, on Regional Populations, and on Biometrics, Conservation, and Management which identified and defined critical gaps in biological knowledge of whale populations, discussed means of filling the gaps, and suggested measures to prevent further deterioration of the critical world-wide

situation of whale populations. The conference proceedings will be published later.

A-10650
Robin, G. de Q.
FORTY-FOURTH ANNUAL REPORT ON THE WORK OF THE SCOTT POLAR RESEARCH INSTITUTE. Polar record, Jan. 1972 16(100), p. 167-177
G575.P6
The work of the Institute is reported for the period Oct. 1, 1969 to Sept. 30, 1970. Data are given on personnel, staff and research students, visiting scholars, teaching and research activities, library and information services, manuscript acquisitions, and museum exhibits. Research was continued in glaciological, geological, geographical, and historical studies including, in the Antarctic, radio echo sounding and satellite photography of the ice sheet, distribution of pack ice and drift of large icebergs. A list of publications by the staff and research students is included.

A-10653
U.S. Geological Survey
ERTS AND EROS. Geotimes, March 1972 17(3), p.20-23
QE1.G56
In June NASA will launch its first experimental Earth Resources Technology Satellite (ERTS-A), designed to view the earth systematically with remote-sensing instruments that will provide new information about our resources and environment. The Earth Resources Observation Systems (Eros) Program under the management of the U.S. Geological Survey, has submitted 70 experiment proposals to NASA to evaluate the applications and use data from the ERTS-A satellite. One of the 40 proposed investigations accepted by NASA for participation in the program will be an experiment to test the utility of Return Beam Vidicon (RBV) data in detecting various glaciological features of the Antarctic continent and in compiling planimetric sketch maps or photomaps of poorly mapped Antarctic areas. Plans also include the compilation of a 1:10,000,000-scale photomap of the entire Antarctic continent, and Arctic coverage.

A-10669
Bixby, W.
ROBERT SCOTT: ANTARCTIC PIONEER. New York, J.B. Lippincott, 1970, 143p.
Scott's activities during the British Antarctic Expeditions in 1901-04 and 1910-13, are recounted in 15 chapters: (1) The black flag; (2) The path to the Pole; (3) South to ice; (4) Pioneer in the snow; (5) Dangerous journey; (6) Disaster and death; (7) Dog trouble; (8) Winter; (9) Heading south; (10) Race against death; (11) Prisoners in the ice; (12) Goodby to the Antarctic? (13) Return to McMurdo; (14) The long journey home; and (15) Waiting at Cape Evans. Several sledge journeys in Victoria Land were made during the first expedition. In the second expedition, Scott, heading S. via Ross Ice Shelf and Beardmore Glacier, reached the South Pole on Jan. 17, 1912, 34 days after Amundsen's arrival. Scott and his four companions died on the return journey.

A-10684
Willis, T.
FROZEN WORLD. London, Aldus, 1970, 191p.
The Frozen World is a history of the exploration in the Artic since 1576 and in the Antarctic since 1772, discovery of the North and South Poles, and other accomplishments and experiences of the explorers during their adventures. The eleven chapters in the book describe the following: (1) The ends of the Earth; (2) A northern passage to Cathay; (3) The great Southland; (4) The search for Sir John Franklin; (5) The true Viking; (6) Reaching the North Pole; (7) Duel for the South Pole; (8) The home of the blizzard; (9) The riddle of the copper eskimos; (10) Shackleton in the Antarctic; and (11) The Poles today. Also included are an appendix of firsthand material recording the exploits and impressions of the explorers, a list of explorers and important events in their life, and a short glossary.

A-10685
Tsareva, L.D.
PHYSICAL AND MECHANICAL CHARACTERISTICS OF SOME SPECIES OF MARINE FAUNA IN THE ANTRACTIC. Issledovanie fiziko-mekhanicheskikh kharakteristik nekotorykh syr'evykh ob''ektov Antarktiki. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo koziaistva i okeanografii. Trudy molodykh uchenykh, 100 No. 2, p.122-132, In Russian
Krill, poutassou, hake, and South Georgia cod from the Falkland-Patagonia shelf waters and from the Scotia and Weddell Seas were studied in 1967-68 to obtain data which can be used in designing equipment for fish and krill processing. Specific gravity, bulk density, packing weight, angle of natural slide (angle between the generatrix of a cone and horizontal surface), and angle of slide for various surfaces were measured. Some values were obtained showing that the angle of natural slide is from 2 to 4 deg greater for fish caught 2-3 hours before, than for fish just caught. A lesser angle of slide is required for a plastic than for a wood surface. A wet surface requires a greater angle of slide.

A-10697
Johnson, R.W. , Smith, P.M.
ANTARCTIC RESEARCH AND LUNAR EXPLORATION. Advances in space science and technology, 1970 Vol.10, p.1-4, 24 refs.
TL787.A3
The United States research program in Antarctica and the proposed lunar program are examined in terms of their similarities and dissimilarities. The discussion includes the following topics: Mission objectives, Role of man, Environment, Logistics, Shelter, Construction, Transportation, Program administration and planning, Economic benefits, and National security and prestige and international cooperation. It is demonstrated that the experience accumulated by man in the program of exploration, discovery, and research in Antarctica can be valuable in planning lunar operations and missions. Although the experience is useful in understanding how to proceed, it provides no clues to why lunar exploration should be attempted.

A-10701
France. Ambassade. U.S. Service de Presse et d'Information
FRENCH ANTARCTIC AND SUBANTARCTIC LANDS. London, 1971, 29 p.
France possesses a number of islands that are grouped, together with the French portion of the Antarctic continent, into one administrative

framework. These territories have been given the overall name of Territoire des Terres Australes et Antarctiques Francaises (T.A.A.F.). The French island possessions consist of the isles of Saint-Paul and Amsterdam, at the southern extremity of the temperate Indian Ocean, and of the Crozet and Kerguelen archipelagoes at the northern extremity of the Antarctic Indian Ocean. These lands, which are more than 15,000 km away from France, have in common their Antarctic and Subantarctic fauna, the fact that they were uninhabited until very recent times, and their extremely limited economic activity. But since the end of the second world war, they have served as a base for some far from negligible scientific activities, which make them well worth studying. This survey examines the history and geography of the territories, gives a brief outline of their administrative organization, and discusses the economic and scientific activities pursued there.

A-10728
Gjelsvik, T.
ACTIVITIES OF NORSK POLARINSTITUTT IN 1970. Norsk Polarinstitutts virksomhet i 1970. Oslo. Norsk polarinstitutt. Årbok, 1970 (Publ. 1972). p. 271-296. In Norwegian with English summary.
G575.C78

The Norwegian Antarctic Expedition worked in the H.U. Sverdrupfjella area, Dronning Maud Land from Nov. 30, 1970 to Feb. 3, 1971. Members were flown into the area from McMurdo Station by U.S. aircraft. Field work comprised geology, glaciology, meteorology, and biology. Other activities of the Institute included the construction of maps of Vestfjella, Dronning Maud Land, and continued work on 1:500 000 and 1:250 000 maps of Dronning Maud Land. In addition to investigating geological material from Vestjella, T. Winsnes prepared the SCAR/IUGS Symposium on the geology of Antarctica and planned the Institute expedition to Dronning Maud Land 1970-71. A paper on the upper wind over Maudheim Station was submitted for printing during this period.

A-10734
Buenos Aires. Instituto Antártico Argentino
NATIONAL REPORT TO S.C.A.R. ON ANTARCTIC SCIENTIFIC ACTIVITIES FOR THE YEAR 1969 (1ST JANUARY 1969 TO 31ST MARCH 1970) AND PLANNED PROGRAM FOR 1971. Informe de Progreso, 1970 No. 11SG, 47p., 37 refs.
Q180.A6B8

The Argentine scientific activities in Antarctica during 1969 and Jan. Feb., and March, 1970 covered by this report were accomplished at eight permanent stations and one temporary station; also from ships and aircraft which operated in the area. A listing of all stations, ships, aircraft and participating institutions is given. The various programs and activities are described and summarized. The program for 1971 is essentially the same as for 1969 and 1970, and the exceptions are noted.

A-10787
Dukert, J.M.
THIS IS ANTARCTICA. New and revised ed., New York, Coward, McCann and Geoghegan, 1971, 192p.
G860.D8

In an earlier edition many of the changes were predicted which are affecting Antarctic operations today--weather satellites, plastic buildings, hard-surface roads, and regular tourist visits. In the present work this and other new material up-date the Antarctic continent. Eleven chapters include discussion of the general geography and climate of the continent: early history; life, travel, and work; plant, animal, and bird life; international cooperation under the Antarctic Treaty; and scientific activities. Science is discussed throughout, because all U.S. activities relating to the Antarctic are managed by the National Science Foundation. Future predictions for the continent include new kinds of vehicles, robot stations linked with satellites, more undersurface probes, and Antarctica's eventual involvement in world commerce.

A-10794
Guthridge, G.G.
MIDSEASON FIELD ACTIVITIES, DECEMBER 1970-JANUARY 1972. Antarctic journal of the United States, March-April 1972 7(2), p. 25-34

The midseason field activities of the 1971 U.S.A.R.P. denote the research at six stations and aboard icebreakers in the Ross, Amundsen, and Bellingshausen Seas. The Eltanin worked in the Indian Ocean and Antarctic waters. The Hero continued to operate in the Antarctic Peninsula area in conjunction with Palmer station Details of the field programs at Amundsen-Scott South Pole, Byrd, Siple, McMurdo, Hallett, and Palmer Stations are given. The major efforts have been a survey of prospective sites for the Dry Valley Drilling Program; a glaciologic team near Byrd Station; a remote sensing program over East Antarctica; establishment of Siple Station as a year round facility; and the closeout of Byrd Station. As part of the International Antarctic Glaciological Project the transportation of French scientists and supplies along the Carrefour to Vostok traverse route was accomplished on a modified basis. Air operations are described and the V.I.P. visitors are listed.

A-10799
Dosa, L.
ANTARCTICA EXPLORED 1966. Washington, D.C., Voice of America. News and Current Affairs Features -- Challenge of Science, May 10 - Aug. 2, 1966 No. 14-26, 86p.

The manuscript is the narrative for Antarctica Explored 1966, a continuing weekly presentation about exploration and research in the Antarctic continent, in the Challenge of Science series of programs broadcast by the Voice of America. From May 10 to Aug. 2, 1966, 14 broadcasts have been made under the following titles: A Look at the Past; International Cooperation; Formation of Continents; Ice Reveals Secrets of the Past; Cosmic Message; Influence on World Weather; Seals, Penguins, and Skua Birds; Giant Airplanes and Ice-breakers; Sailors Support Scientists; A Flight to Antarctica; The New Plateau Station; It's A Man's World; Antarctica, 1966; and Man and the Future of Antarctica. Scientists, heads of operations, program directors, and others knowledgeable about the Antarctic participated in the broadcasts.

A-10801
South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research
TENTH REPORT TO SCAR ON SOUTH AFRICAN ANTARCTIC RESEARCH ACTIVITIES DURING THE TWELVE MONTHS ENDED DECEMBER 1967, WITH A SUMMARY OF ACTIVITIES DURING 1968 AND PLANNED FOR 1969. C.S.I.R. Special report INFO 27, Pretoria, Aug. 1968, 24p., 39 refs.

This report to the Scientific Committee on

Antarctic Research (SCAR) of the International Council of Scientific Unions provides information on the South African Antarctic Research Programs carried out during 1967, with a summary of the activities being carried out during 1968 and planned for 1969. Program lists show the station location, equipment and instruments used, type and schedule of observations, observation and computation procedure, and type of data resulting at SANAE Station, Marion and Gough Is. and abroad the Republic of South Africa. Membership of the South African SCAR and working groups is listed. Publications, in print and in preparation, relating to the South African programs are included.

A-10802
Akademiia nauk SSSR. Mezhduvedomstvennaia komissia po izucheniiu Antarktiki
U.S.S.R. NATIONAL REPORT TO SCAR, NO.11, 12, 13. Moscow, 1969, 1970, 1971, 70, 80, 63p., 112, 225, 152 refs.

The scientific programs completed annually by the Soviet Antarctic Expedition at Bellinghausen, Mirnyy, Vostok, Novolazarevskaya, and Molodezhnaya Stations are listed. The lists show the station location, equipment and instruments used, type and schedule of observations, computation procedures, and type of data resulting at the stations and aboard the Ob', Professor Vize, and Professor Zubov. The institutions serving as data depositories for each subject discipline are indicated and a bibliography of publications relating to the program is included. Summaries are given of research programs proposed for succeeding years.

A-10803
ARRIVAL HEIGHTS RECORD IN PROJECT EARTHWORKS. Antarctic, Dec. 1971 6(4), p.110
G845.A55

Arrival Heights, about 3 mi from Scott Base on Ross I., was the background for one of 15 sets of simultaneous observations made throughout the World to provide a tape and photographic record of the passing of the equinoxes as part of Project Earthworks. Teams of observers at localities ranging from Arrival Heights in the south to Aklavik, Canada in the north, and from San Diego in the west to Tokyo in the east were asked to take a dozen photographs of the physical environment of the recording post, make 10-min tape recordings, and on the tapes to record their impressions of the environment, the sounds of the environment, and meteorological data. The tapes will be synchronized and mixed on to a master and the still photographs will be interjected into a film of the New Zealand equinox, both to be used in making a film document. The observations at Arrival Heights were recorded in near-perfect conditions.

A-10804
NEW ZEALAND ACTIVITIES TO BE FILMED BY AUSTRIAN TEAM. Antarctic, Dec. 1971 6(4), p.111
G845.A55

New Zealand's scientific program at Scott Base and Vanda Station in the Wright Dry Valley will be recorded in color by two noted Austrian documentary film-makers -- Rheinhold Materna and his brother, Walter Materna. The film which may be shown on television in a dozen or more countries, has the support of the Antarctic Division of the Department of Scientific and Industrial Research. The Materna brothers have an international reputation as makers of documentary films.

A-10805
WHALE CATCH LIMIT REDUCED BY COMMISSION. Antarctic, Dec. 1971 6(4), p.115
G845.A55

A reduction in the pelagic catch limit for the 1971-72 Antarctic whaling season has been made by the International Whaling Commission. The limit has been set at 2,300 blue whale units, 400 units less than the limit for the previous season. One blue whale unit equals one blue whale, two fin whales, or six sei whales. Six expeditions operating in the Antarctic in 1970-71 caught 2,890 fin whales and 6,153 sei whales (equivalent to 2,470 blue whale units), and 2,745 sperm whales. In 1969-70 seven expeditions caught 3,001 fin whales and 5,856 sei whales (equivalent to 2,477 blue whale units), and 3,090 sperm whales. The total production of baleen and sperm oil was 470,287 barrels from the 1970-71 season and 461,285 barrels from the 1969-70 season. The maximum sustainable yield of sei and Minke whale stocks was estimated at 5,000 each. The commission will appoint observers from member countries to serve on factory ships and at land stations of other member countries.

A-10808
U.S. AND PRIVATE VENTURES. Antarctic, Dec. 1971 6(4), p.119
G845.A55

The Antarctic Policy Group at the U.S. State Department has stated that the U.S. considers Antarctica an open continent, and there is nothing in the Antarctic Treaty or in U.S. policy to prohibit private ventures there as expeditions or aircraft flights. Safety and the use of U.S. facilities are two major concerns of the Antarctic Policy Group when considering private ventures in the Antarctic. Requests for logistic support, transport, and accomdation are considered legitimate matters for Government consideration. The group is interested in safety for humanitarian reasons, and because an ill-conceived venture which got into difficulty could cause a drain on scarce resources.

A-10819
ROSS DEPENDENCY STAMP ISSUE. Antarctic, Dec. 1971 6(4), p.139
G845.A55

To mark the 60th anniversary of Scott's arrival at the South Pole a new set of definitive stamps for the Ross Dependency will be issued on Jan. 18, 1972. They will replace the present set which was first issued in 1957. Shown on the stamps are a skua (3 cent), a Royal New Zealand Air Force Hercules (4 cent), Shackleton's hut at Cape Royds (5 cent), H.M.N.Z.S. Endeavour in McMurdo Sound (8 cent), Scott Base (10 cent), and a tabular ice floe (18 cent).

A-10820
GEORGE DOVERS: VETERAN OF MAWSON EXPEDITION. Antarctic, Dec. 1971 6(4), p.140-141
G845.A55

One of Australia's first Antarctic explorers, George Harris Sarjeant Dovers, a cartographer, died in Sydney early in July at age 84. He was one of the six survivors of Sir Douglas Mawson's 1911-1914 expedition to Adelie Land which discovered King George V Land and Queen Mary Land, and a member of the western party led by Frank Wild which spent a year on the Shackleton Ice Shelf, the first Antarctic camp to

be established on floating barrier ice. His name has been given to a prominent cape south-southwest of Henderson I. on the coast of Queen Mary Land, part of which he mapped nearly 60 yr ago.

A-10821
Aver'ianov, V.G. , Koblents, IA.P.
150 YEARS SINCE THE DISCOVERY OF ANTARCTICA AND SOVIET ANTARCTIC INVESTIGATIONS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.485-491, Translated from its Informatsionnyi biulleten' No.77, 1970. 10 refs.
Q115.S6862

This review of Russian investigations in the Antarctic includes accounts of the first Russian Expedition in 1819-21 under the leadership of Bellingshausen and Lazarev, as well as the results of research in geography, meteorology, glaciology, oceanography, biology, and atmospheric and terrestrial physics for the 150-year period. The most important result of the studies of the south polar region by Soviet scientists is the Antarctic Atlas (C-4834 and C-8497).

A-10842
Budretskii, A.B. , Shamont'ev, V.A.
RESULTS OF THE FIRST YEAR OF WORK OF BELLINGSHAUSEN STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.571-573, Translated from its Informatsionnyi biulleten' No.78, 1970. 3 refs.
Q115.S6862

Eleven men stayed for the winter at the new Bellingshausen Station, opened on Feb. 22, 1968, the first Soviet station in West Antarctica, located on Fildes Peninsula, in the South Shetland Is. A site map of the station area showing locations of the facilities is given. Regular meteorological, actinometric, oceanographic, glaciological, geomorphological, physiographic, biological, and medical observations initiated at the station immediately after its opening, are briefly described. Uninterrupted radio observations throughout the year made it possible to collect extensive scientific information. Visits by foreign ships, including one American touring party, and the start of construction of a Chilean meteorological radio center adjacent to the station were part of the instructional aspects of the first year's activities.

A-10865
Ronne, F.
TRIBUTE TO AMUNDSEN. Explorers journal, Dec. 1971 49(4), p.263-264
G1.E93

Roald Amundsen became the first man to reach the South Pole at 3 o'clock in the afternoon, Dec. 14, 1911, after 55 days of traveling almost 1,400 km from base camp Framheim in the Bay of Whales. Amundsen himself declared that the Pole had been reached through the combined efforts of a good ship, the Fram, 19 good men, and 116 splendid Greenland huskies. The group remained at the Pole until Dec. 17, making the necessary position observations on the sun around the clock. On leaving they placed the Norwegian flag atop a small tent at the exact location of the geographical South Pole. (The tent had been made by Sailmaker Martin Ronne, a member of Amundsen's party and father of the author). Inside of the tent was a plaque bearing the names of the men with the request that a later finder return the plaque to civilization as evidence of the discovery. All sorts of writing were found, including the names of Martin Ronne's family. The author considers the inclusion of his own name in the writing as his introduction to Antarctica, which he reached years later on his own.

A-10910
Shpaikher, A.O.
U.S. RESEARCH IN ANTARCTICA IN THE SUMMER OF 1967/1968 (LITERATURE SURVEY). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.433-436, Translated from its Informatsionnyi biulleten' No.75, 1969. 15 refs.
Q115.S6862

The literature survey on research activities of U.S. scientists in the Antarctic in the 1967-1968 summer is summarized. The larger U.S. field operation of exploring Marie Byrd Land and Coats Land, included air photo, geological, cartographic, biological, geophysical, and glaciological surveys. The transantarctic South pole-Queen Maud Land traverse covering a total distance of 1312 km was completed using Sno-Cats which were equipped with electronic and other devices necessary for investigations specified by the program. A highlight of the season was the discovery in the Transantarctic Mts. of the remains of a jaw bone from an amphibian of the subclass Labyrinthodonia, which lived 200 m.y. ago. To support the scientific studies and carry personnel and equipment in the 1967-68 summer season, the Antarctic air group used 7420 hours, and the icebreaker-based helicopters 550 hours of flight time.

A-10921
Aver'ianov, V.G.
INTERNATIONAL COOPERATION OF GLACIOLOGISTS IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.470-471, Translated from its Informatsionnyi biulleten' No.76, 1969.
Q115.S6862

A meeting held in Paris on May 27-29, 1969, for organizing and developing a scientific program of international glaciological investigations in Antarctica, was attended by representatives from the U.S.S.R., U.S., France , Australia, and the secretary of SCAR. The suggestion by the Soviet delegation that the investigations be conducted according to a unified program within the framework of national expeditions was adopted and called the International Antarctic Glaciological Project (IAGP). Scientific programs to be developed by the member countries of the IAGP in 1969 are to cover East Antarctica between 60 and 160 deg E and 80 deg S, during a 10-yr period starting in 1970.

A-10936
Stoertz, C.R.
ANTARCTICA - A CONTINENT RESERVED FOR SCIENCE. Marine technology society. Journal, May-June 1971 5(3), p.51-57
GC1.J63

A popular account is given of the general geographic and climatic features of the Antarctic continent and the scientific research activities being carried out there. Included are descriptions of the air flight from New Zealand to Antarctica, McMurdo, Byrd, and South Pole stations, Operation Deep Freeze activities,

international ccoperation under the Antarctic Treaty, and scientific activities being conducted under the Antarctic research program at the various U.S. stations. In addition to studies of the atmospheric conditions, glaciology, geology, seismology, and biology of the Antarctic continent, NSF's 266 ft research ship Eltanin is engaged in a 15-yr long survey of the Antarctic ocean. Short-term biological and geological studies are conducted aboard the smaller research vessel Hero.

A-10946
Tsurikov, V.L. , Dvorkin, E.N.
FIFTIETH ANNIVERSARY OF THE ARCTIC AND ANTARCTIC SCIENTIFIC RESEARCH INSTITUTE. Oceanology, 1971 (Publ. May 1972) 11(5), p.758-760. Translated from Okeanologiia.
GC1.03913
Activities of the Arctic and Antarctic Scientific Research Institute from 1920 to 1970 and most recent investigations reported by various authors during anniversary meetings are summarized. Transactions of the institute have been published regularly in Problemy Arktiki i Antarktiki and in Informatsionnyi biulleten' Sovetskoi antarkticheskoi ekspeditsii. A special anniversary issue of the Problemy Arktiki i Antarktiki published on this occasion covers the main Soviet studies in polar regions for the last 50 years. Included is the E.S. Korotkevich's report "Basic scientific results of Soviet Antarctic research".

A-10953
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izucheniiu Antarktiki
ANTARCTIC (ANTARKTIKA). New Delhi, Indian National Scientific Documentation Centre, 1971. 262p., TT 67-59072, Translation of Antarktika: Doklady komissii, 1965, Moskva, Nauka, 1966. Numerous refs.
This is an English translation from the Russian of articles on political geography, geology, terrestrial physics, cartography, oceanography, meteorology, and biology, reviewing work through 1965. For abstracts of the individual articles see: A-10954; B-10963, 10964; C-10958, 10965; E-10956; I-10960, 10961, 10962; J-10959; L-10957; and M-10955.

A-10954
Tolstikov, E.I.
TEN YEARS IN ANTARCTICA. Antarctic (Antarktika), 1971, p.1-17, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966.
A general review is presented of the first 10 Soviet Antarctic expeditions. Establishment of stations, traverse conditions, and observations conducted on the continent are discussed. In addition, the Soviet marine expeditions are treated. The extent of scientific results obtained in meteorology, glaciology, geology, ionosphere studies, and oceanography is indicated, and some results are given. (For Russian original see A-5038)

A-10967
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izucheniiu Antarktiki
ANTARCTIC (ANTARKTIKA). New Delhi, Indian National Scientific Documentation Centre, 1971. 279p., TT 67-59071, Translation of Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. Numerous refs.
This book deals with results of Russian investigations in geology, glaciology, atmospheric and terrestrial physics, meteorology, oceanography, and medicine in the Antarctic up to 1964. For abstracts of the individual articles see: E-10968, 10969, 10971, 10979; F-10972, 10975, 10980, 10981; H-10977, 10978; I-10976; J-10974; K-10973; and L-10970.

A-10986
Heg, J.E.
CONFERENCE ON THE CONSERVATION OF ANTARCTIC SEALS. Antarctic journal of the United States, May-June 1972 7(3), p.45-49
G845.A56
The convention for the conservation of antarctic seals emerged from a conference held in London on Feb.3-10, 1972 which negotiated stronger measures than those of the Antarctic Treaty which provided protection to seals and other animals only on the land and sea shelves south of 60 deg S. Adopted measures set annual take limits based on scientifically established seal population estimates; permit hunting of only three species, crabeater, leopard, and Weddell; prohibit sealing in reserve areas; prohibit killing or capturing seals in water, except limited quantities for research; provide for the exchange of information on sealing activities; and establish a system of international inspection any time after the beginning of commercial operations. The text of the convention, which is open to the government signatures and which is being discussed by the U.S. State Department with members of Congress, government agencies and private groups, is included.

A-10988
McGinnis, L.D. , Torii, T., Webb, P.N.
DRY VALLEY DRILLING PROJECT. Antarctic journal of the United States, May-June 1972 7(3), p.53-56, 4 refs.
G845.A56
Scientists from Japan and New Zealand joined with the United States to organize an international program called the Dry Valley Drilling Project (DVDP). The project has been expanded to explore the physical, chemical, and biological regimen of the subsurface in the arid ice-free valleys, the Ross Island volcanics, and the McMurdo Sound marine sediments. In the 1971-1972 field work electrical depth soundings gave information on permafrost thickness and the nature of the underlying material. Seismic refraction profiles were run in lake basins to establish overburden thicknesses and bedrock structure and relief. Microbiological sampling of both air and soils was conducted near each camp site. Samples of soil and water were collected for geochemical analysis. The distribution of bottom sediments beneath Lake Vanda was determined using a shallow coring device. Raised beaches in the valleys were identified to add further control during drilling. A regional aeromagnetic study having flight lines at 2-km intervals is 50 percent complete to give structural control for tectonic interpretation.

A-10992
Guthridge, G.G. ed
CARL R. EKLUND BIOLOGICAL CENTER DEDICATED AT MCMURDO STATION. Antarctic journal of the United States, May-June 1972 7(3), p.68
G845.A56

On February 27, 1972, personnel of the U.S. Antarctic Research Program, the U.S. Naval Support Force, Antarctica, and New Zealand's Scott Base gathered at McMurdo Station to dedicate the biological laboratory in memory of Carl Robert Eklund, biologist, who died in 1962. The selection of the biological laboratory as a memorial to Carl Eklund is an acknowledgement of his dedication to polar research and his contribution to antarctic biology. Built in 1959, the laboratory was the first scientific facility for support of research in Antarctica, and indeed for many years was the only professional laboratory in the Southern Hemisphere below 55 deg S. The eulogy at the dedication ceremony and commemoration are included in the article.

A-10995
BUSY SUMMER SEASON AT SCOTT BASE AND VANDA.
Antarctic, Mar. 1972 6(5), p.146-147
G845.A55

A successful meteorological program at Vanda Station, continuance of upper atmosphere studies at Scott Base, installation of a wet laboratory for the University of Canterbury marine research unit at Cape Bird, and establishment of a refuge hut at the lower end of the Wright Valley, were among summer season activities of New Zealand Antarctic Research teams. Equipment to receive very low frequency signals induced by electric storms in the ionosphere was installed at Scott Base for a 12 mo period. The hydrological and glaciological party working at Vanda Station and in the Asgaard Range completed work on the river flow into Lake Vanda and on the movement of three glaciers in the mountains overlooking the lake. A documentary film was made of the activities at Scott Base during the summer by two Austrian documentary film-makers.

A-10998
PLANS FOR CO-ORDINATED SCIENTIFIC ACTIVITIES.
Antarctic, Mar. 1972 6(5), p.151
G845.A55

A more coordinated effort between American and New Zealand scientists in their future activities in the Antarctic may be one result of the planning conference held at McMurdo Station in January. The conference, held in the Antarctic instead of New Zealand for the first time, was concerned with the more efficient and economic operation of United States and New Zealand scientific and support programs. Two joint programs are the international dry valley drilling project, and the drilling program on the Ross Ice Shelf. Greater coordination is planned for a number of upper air physics programs, including meteorology. New Zealanders now man American equipment at Scott Base; next year New Zealand equipment for upper air physics studies will be operated by American scientists at Siple Station. The United States Navy support force is expected to consider the use of New Zealand-based facilities - such as communications and aircraft maintenance - instead of providing its own units in Christchurch or sending material back to the United States - a time-consuming and costly procedure.

A-10999
SHALLOW WATER DIVING TRIALS AT CAPE BIRD.
Antarctic, Mar. 1972 6(5), p.152-153
G845.A55

A preliminary shallow water diving program to determine the feasibility of using scuba divers for underwater research was an important part of the work done at Cape Bird this summer by the University of Canterbury's zoology department. A small wet laboratory was installed by the Antarctic Division on the beach and electricity for the station was supplied by a diesel generator. The summer program was divided into four major projects: completion of a bentnic survey initiated in the 1970-71 season, an ecological study of Paramoera walkeri, a very abundant sub-tidal amphipod crustacean, a study of push ice deterioration and beach formation, and the diving program, using the University's trimaran Clione as a diving platform. Eight dives were made lasting an average of 20 min each, and ranging in depth from 19-1/2 to 75 ft.

A-11003
FAMOUS POLAR EXPLORERS. Antarctic, Mar. 1972 6(5), p.161
G845.A55

Four famous polar explorers -- Sir James Clark Ross, Sir Martin Frobisher, Henry Hudson, and Capt. Robert Falcon Scott -- are commemorated by a new series of stamps issued by the British Post Office on Feb. 16. Ross is the subject of the 3p stamp and Scott's portrait is on the 9p stamp.

A-11004
Jones, A.G.E.
FRANK WILD: INCURABLE ADVENTURER. Antarctic, Mar. 1972 6(5), p.162-166, 17 refs.
G945.A55

Frank Wild, Royal Navy, joined the Discovery as a seaman on July 27, 1901, at London, under the command of R.F. Scott. During his service with the Discovery he went through 3 Antarctic summers and 2 winters, and found his place in life as a man of action and adventure. Wild's subsequent activities included joining Shackleton's Antarctic expedition and becoming a member of the sledge party which achieved lat 88 deg 23 min S; taking charge of Mawson's western party in his Antarctic expedition of 1911-14; and rejoining Shackleton as second-in-command of the British Trans-Antarctic Expedition. During this expedition Wild held together a large party of weakened men at Elephant I. on shortened rations with no shelter other than an upturned boat while Shackleton sought assistance following the loss of the Endurance in the pack ice of the Weddell Sea. For his work on this expedition Wild received the Back Award of the Royal Geographical Society. He also received the society's gold Patron's Medal for his achievements during the Quest expedition which he took charge of following the death of his close friend Shackleton. From this time on Wild's life appears to have been uneventful. He died in 1939 and was buried at the Brixton Cemetery in Johannesburg.

A-11005
TWO-MONTH EXPLORATION IN MACROBERTSON LAND.
Antarctic, Mar. 1972 6(5), p.167-168
G845.A55

Scientists of the 17th Soviet Antarctic Expedition have completed a 2-mo exploration program in MacRobertson Land, a region that has not been studied in depth previously. Geologists, biologists, and surveyors covered an area of approx 100,000 sq mi, using helicopters and light aircraft. The deepest penetration by the expedition was the Komsomolsky Peak, a 10,000 ft mountain jutting out of the ice-cap 500 mi from the coast. A drilling rig at Vostok Station has penetrated the ice cover of the Antarctic to a depth of 1720 ft, obtaining an ice core more than

15,000 yr old. Buried spores, bacteria, and dust particles of terrestrial and cosmic origin are being studied by this technique. Lasers will be used on a large scale this year to obtain a clearer picture of glacier movement in wide areas of the Antarctic. A tractor-drawn sledge train of 9 tractors completed a 900-mi journey from Mirnyy to Vostok in the record time of 34 days. The Gruziya and the Navarin, two cargo-icebreaker type sships were used for the first time in Antarctic operations. An electrically-heated light-weight "penguin" suit, which will keep a man warm at temperatures of minus 55 deg F, has been developed for use by members of Soviet Antarctic expeditions.

A-11007
MUSEUM HONOURS "A VERY GALLANT GENTLEMAN".
Antarctic, Mar. 1972 6(5), p.172-173
G845.A55

The collections in "The Wakes", a home in the English village of Selborne, Hampshire opened as a museum in 1955, are in two parts: those relating to Gilbert White an 18th century clergyman-naturalist and author, and those commemorating the Oates family, a prominent member of which was Capt. Lawrence Oates, the Antarctic explorer, who died while returning from the South Pole with Scott. On the desperate march back from the Pole, Oates, weakened by scurvy and frostbite, and finding himself a hindrance to the chances of survival of his three companions, walked out into the blizzard that kept the party tent-bound on Mar. 17, 1912. The material in the museum relevant to Capt. Oates is described.

A-11010
McElrea, R.F.
SUMMER CARETAKERS WORK ON 'MAYFAIR DWELLINGS'.
Antarctic, Mar. 1972 6(5), p.176-177
G845.A55

The work and observations of the two summer caretakers appointed to maintain the historic huts at Cape Royds and Cape Evans are described. The tasks included snowproofing Scott's Discovery hut and working primarily on the surroundings of both Scott's and Shackleton's huts, extracting valuable relics and discarding the residue of litter. Clothing, implements, books, scientific and medical equipment, 2 bicycle wheels, and a sheet of paper recording in pencil a game score of 3 of Scott's men were among the relics retrieved from the huts.

A-11011
Conly R.M.
ANTARCTICA OBSERVED BY A NEW ZEALAND PAINTER.
Antarctic, Mar. 1972 6(5), p.178-180
G845.A55

The observations of a New Zealand artist who visited the Antarctic to prepare a series of paintings on the role of the Royal New Zealand Air Force and New Zealanders in the southern continent are given. Included are descriptions of the climate, the great natural beauty of the Antarctic, the colorful activity of life at Scott Base and Williams Field, the penguins and other animal life, and the contrasts in settings of the historic huts at Cape Royds and Cape Evans. For quick color sketches, water colors were possible, done with hot water. Due to the below freezing temperatures, however, brushes froze solid, slivers of colored ice attached themselves, and washes sometimes lifted off the paper in layers of frost. The assignment was considered a great challenge.

A-11014
Gulland, J.
FUTURE OF THE BLUE WHALE. New scientist, Apr. 27, 1972 54(793), p.198-199
Q1.N52

Fears have been expressed recently that the blue whale -- the largest of living animals, reaching 100 ft in length and weighing up to 100 tons -- may shortly become extinct. Whether or not these fears are justified depends partly on whether the International Whaling Commission's (IWC) ban on the killing of blue whales is being adequately observed, and secondly on the present numbers of whales. Two sets of estimates of the numbers of blue whales in the Antarctic are available, based on sightings from survey vessels, and on the analysis of the commercial catches. Analyses of the catches were for the most part carried out by the Committee of Three independent scientists set up by the IWC, based on the De Lury method. The difficulties in applying this method are discussed. It is estimated, however, that the most likely recent history of blue whale numbers would be a catchable stock of some 4000 whales in 1963, which has increased to some 6000 now (at some 4 to 5 per cent/yr) plus a similar number of pygmy blue whales. These figures do not correspond to a population on the fringe of extinction.

A-11015
South Africa. Weather Bureau
NEWS FROM THE ISLANDS AND ANTARCTICA. Nuus van die eilande en Antarktika. Nuusbrief (News Letter), Jan. 1971 No. 262, p.2-3
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11016
South Africa. Weather Bureau
NEWS FROM THE ISLANDS AND SANAE. Nuusbrief (News Letter), Feb. 1971 No.263, p.22-24
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11021
PYRRHIC VICTORIES FOR THE FRIENDS OF WHALES.
Nature, July 7, 1972 238(5358), p.4
Q1.N2

The International Whaling Commission at its annual meeting in July, 1972 lists the following achievements: (1) a complete and indefinite ban on the taking of blue, right, gray, bowhead and humpback whales; (2) the introduction of international observers on all whaling ships; (3) the abolition of the blue whale unit; (4) the reduction of quotas on endangered species, and the introduction of one for the minkie whale; and (5) the creation of a committee to examine IWC's procedures and to strengthen them. The blue whale unit, now finally abolished, has been the IWC's biggest curse. It equates 1 blue whale to

2 fin whales to 2.5 humpback whales to 6 sei whales, and catches in the Antarctic have been estimated in these units. As a result, the larger whales are hunted to near extinction before the smaller whales are sought, as about the same amount of effort goes into catching a sei whale as a blue. The reduction of quotas is shown for the Antarctic, the North Pacific, and the Southern Hemisphere.

A-11050
Oslo. Norsk polarinstitutt
REPORT ON I. NORWAY'S ANTARCTIC RESEARCH ACTIVITIES 1963 AND 1964; II. NORWAY'S ANTARCTIC ACTIVITIES PROPOSED FOR 1966. Oslo. Norsk polarinstitutt. Report to SCAR, June 1965, 3p., 7 refs.

Norwegian bases were not operational during 1963 and 1964. One glaciologist, participating in the United States South Pole-Dronning Maud Land Traverse during the 1964-65 Antarctic summer season took surface meteorological observations and measurements of the sastrugi patterns encountered. Activities proposed for 1966 include only one participant in the National Science Foundation's program in Antarctica.

A-11051
Académie des sciences, Paris. Comité national français des recherches antarctiques
REPORT NO.11 TO THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH. SUMMARY OF SCIENTIFIC ACTIVITIES FOR THE YEAR 1969 AND OF SCIENTIFIC RESEARCH PROGRAMS FOR THE YEAR 1970. Rapport No.11 au Comité Scientifique pour la Recherche Antarctique. Sommaire des activités scientifiques de l'année 1969 et des programmes de recherches scientifiques pour l'année 1970. Académie des sciences, Paris. Comité national français des recherches antartiques. Report to SCAR, June 1969 No.11, 43p., 64 refs.

This report to SCAR summarizes the nature of the research conducted at French stations during 1969 by discipline, and lists the proposed programs for 1970. The programs were realized within the framework of the Terres Australes et Antarctiques Françaises and with the participation of Expeditions Polaires Françaises. A bibliography of publications pertinent to research in Antarctica is included.

A-11052
Royal Society of New Zealand. National Committee for Antarctic Research
SUMMARY OF RESEARCH PROGRAMMES, 1968 AND PROPOSED RESEARCH PROGRAMMES, 1970. Royal Society of New Zealand. National Committee for Antarctic Research. Report to SCAR, June 1969 No.11, 20p., 45 refs.

Q180.A6N4

Summaries are given of New Zealand Antarctic activities in 1968. The principal observations carried out in atmospheric, earth, and biological sciences at Scott, Cape Bird and Vanda Stations, by the Endeavour and C130H Aircraft are outlined and the proposed program for 1969/70 summer and 1970 winter is summarized. A bibliography of 1968 publications is provided. The programs are formulated by the Ross Dependency Research Committee which, in a non-governmental capacity as a committee of the Royal Society of New Zealand, constitutes the N.Z. National Committee on Antarctic Research. The programs are implemented by the Antarctic Division of the Department of Scientific and Industrial Research.

A-11053
South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research
ELEVENTH REPORT TO SCAR ON SOUTH AFRICAN ANTARCTIC RESEARCH ACTIVITIES DURING THE TWELVE MONTHS ENDED DECEMBER 1968 WITH A SUMMARY OF ACTIVITIES DURING 1969 AND PLANNED FOR 1970. South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research. Report to SCAR, Sept. 1969 No.11, 22p., CSIR Special Report INFO 29. 24 refs.

This report to the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions provides information on the South African Antarctic Research Programs completed during 1968, with a summary of the activities being carried out during 1969 and planned for 1970. Program lists show the station location, equipment and instruments used, type and schedule of observations, observation and computation procedure, and type of data resulting at Borga Base, SANAE Station, Marion and Gough Is. and aboard the Republic of South Africa. Membership of the South African SCAR and working groups is listed. Publications, in print and in preparation, relating to the South African programs are included.

A-11054
South Africa. Weather Bureau
NEWS FROM THE ISLANDS AND ANTARCTICA. Nuus van die eilande en Antarktika. Nuusbrief (News Letter), March 1971 No.264, p.38-39

QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11055
South Africa. Weather Bureau
NEWS FROM THE ISLANDS AND SANAE. South Africa. Weather Bureau. Nuusbrief. News letter, April 1971 No.265, p.63-64

QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11058
Oslo. Norsk polarinstitutt
REPORT ON I. NORWAY'S ANTARCTIC RESEARCH ACTIVITIES 1965; II. NORWAY'S ANTARCTIC ACTIVITIES PROPOSED FOR 1967. Oslo. Norsk polarinstitutt. Report to SCAR, July 1968, 2p., 5 refs.

Norwegian Antarctic bases were not in operation during 1965. One Norwegian glaciologist participated in the U.S. South Pole-Dronning Maud Land Traverse II during the 1965-66 Antarctic summer season, taking surface meteorological observations and measurements of the sastrugi patterns encountered. Activities proposed for 1967 include one participant in the U.S. summer expedition to Plateau Station, Dronning Maud Land.

A-11059
Buenos Aires. Instituto Antártico Argentino
REPORT TO S.C.A.R. ON ANTARCTIC SCIENTIFIC ACTIVITIES, YEAR 1970-71 AND PLANNED PROGRAM FOR 1972. Buenos Aires. Instituto Antartico Argentino. Report to SCAR, June 1971 No.12-13, 55p., 36 refs.
Q180.A6B8

The Argentine Antarctic program was accomplished at seven permanent stations and two other stations that were occupied temporarily; also from ships, aircraft and field parties on land traverses. Nineteen institutions participated in this program, some of them carrying out totally or in part their share of the work in their laboratories or offices at their normal headquarters. The scientific program for 1971-72 is expected to be essentially the same as the program for 1970.

A-11060
Académie des sciences, Paris. Comité national français des recherches antarctiques
REPORT NO. 12 TO THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH. SUMMARY OF SCIENTIFIC ACTIVITIES FOR THE YEAR 1970 AND OF SCIENTIFIC RESEARCH PROGRAMS FOR THE YEAR 1971. Rapport No. 12 au Comité scientifique pour la recherche antarctique. Sommaire des activités scientifiques de l'année 1970 et des programmes de recherches scientifiques pour l'année 1971. Académie des sciences, Paris. Comité national français des recherches antartiques. Report to SCAR, June 1970 No.12, 37p., 54 refs.

This report to SCAR summarizes the nature of the research conducted at French stations during 1970 by discipline, and lists the proposed programs for 1971. The programs were realized within the framework of the Terres Australes et Antarctiques Francaises and with the participation of Expeditions Polaires Francaises. A bibliography of publications pertinent to research in Antarctica is included.

A-11061
Royal Society of New Zealand. National Committee for Antarctic Research
SUMMARY OF RESEARCH PROGRAMMES, 1969 AND PROPOSED RESEARCH PROGRAMMES, 1971. Royal Society of New Zealand. National Committee for Antarctic Research. Report to SCAR, June 1970 No.12, 21p., 57 refs.
Q180.A6N4

Summaries are given of New Zealand Antarctic activities in 1969 winter and 1969-70 summer. The principal observations carried out in atmospheric, earth, and biological sciences at Scott, Cape Bird and Vanda Stations, by the Endeavour and C130H aircraft are outlined and the proposed program for 1970-71 summer and 1971 winter is summarized. The programs are formulated by the Ross Dependency Research Committee which, in a non-governmental capacity as a committee of the Royal Society of New Zealand, constitutes the N.Z. National Committee on Antarctic Research. The programs are implemented by the Antarctic Division of the Department of Scientific and Industrial Research.

A-11062
Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research
REPORT TO SCAR ON NORWAY'S ANTARCTIC RESEARCH ACTIVITIES NOVEMBER 1968-OCTOBER 1970; NORWAY'S ANTARCTIC RESEARCH ACTIVITIES PLANNED FOR NOVEMBER 1970 - OCTOBER 1971. Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research. Report to SCAR, July 1970, 4p., 13 refs.

Six members from the Norsk Polarinstitutt conducted their research at Vestjella in Dronning Maud Land, the investigations comprising work in geology, geomagnetism, glaciology, and topographic/geodetic surveys. Two scientists from the Geophysical Institute, Bergen University, taking part in the International Weddell Sea Oceanographic Expedition - 1969 (IWSOE-69), studied the formation of Antarctic bottom water. One scientist took part in the IWSOE-70 continuing the study of bottom waters. Plans for the 1970-71 season include a six-man team from the Norsk Polarinstitutt to engage in programs involving biology, geology, geophysics, and glaciology at Sverdrupfjella. Wintering stations were not operative in 1969-70 nor planned in 1971.

A-11063
South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research
TWELFTH REPORT TO SCAR ON SOUTH AFRICAN ANTARCTIC RESEARCH ACTIVITIES DURING THE TWELVE MONTHS ENDED DECEMBER 1969, WITH A SUMMARY OF ACTIVITIES DURING 1970 AND PLANNED FOR 1971. South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research. Report to SCAR, Sept. 1970 12, 22p., CSIR Special report INFO 29. 19 refs.

This report provides information on the South African Research Programs carried out during 1969, with a summary of the activities being carried out during 1970 and planned for 1971. Program lists show the station location, equipment and instruments used, types and schedule and computation procedure, and type of data of observation resulting at Borga Base, SANAE Station, Marion and Gough Is. and aboard the Republic of South Africa. Membership of the South African SCAR and working groups is listed. Publications, in print and in preparation, relating to the South African programs are included.

A-11080
South Africa. Weather Bureau
NEWS FROM SANAE AND THE ISLANDS. Nuus van SANAE on die eilande. South Africa. Weather Bureau. Nuusbrief. News letter, May 1971 No.266, p.83-85
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11081
South Africa. Weather Bureau
NEWS FROM THE ISLANDS AND SANAE. South Africa. Weather Bureau. Nuusbrief. News letter, June 1971 No.267, p.105-107
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11082
Académie des sciences, Paris. Comité national français des recherches antarctiques
REPORT NO. 4 TO THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH. SUMMARY OF SCIENTIFIC ACTIVITIES FOR THE YEAR 1961 AND OF SCIENTIFIC RESEARCH PROGRAMS FOR THE YEAR 1963. Rapport No.4 au Comité Scientifique pour la Recherche Antarctique. Sommaire des activités scientifiques de l'année 1961 et des programmes de recherches scientifiques pour l'année 1963. Académie des sciences, Paris. Comité national français des recherches antarctiques. Report to SCAR, June 1962 No.4, 53p., 35 refs.

This report to SCAR summarizes the nature of the research conducted at French stations during 1961 by discipline, and lists the porposed programs for 1963. The programs were realized within the framework of the Terres Australes et Antarctiques Francaises and with the participation of Expeditions Polaires Francaises. A bibliography of publications pertinent to research in Antarctica is included.

A-11083
Santiago de Chile. Instituto Antártico Chileno. Comite Nacional de Investigaciones Antárticas
CHILEAN COMMITTEE OF ANTARCTIC INVESTIGATIONS NATIONAL REPORT TO SCAR FOR THE YEAR 1970 OF ACTIVITIES FOR 1969-1970 AND PROGRAMS FOR 1971. Comite Chileno de Investigaciones Antárticas Informe Nacional al SCAR - 1970: Actividades 1969-1970, Programas 1971. Santiago, Chile, 1970, 20p., 19 refs.

A summary is given of Chile's antarctic research during 1969 and the summer season of 1969-1970 in the atmospheric, biological, and earth sciences at Frei, Prat, Cerda, O'higgins, Videla, Yelcho, and Guesalaga Stations and aboard the Piloto Pardo and Yelcho. The proposed programs in the same sciences for 1971 are listed. A bibliography of publications pertinent to research in Antarctica and a listing of members of the investigative committee are included.

A-11085
International Council of Scientific Unions. Scientific Committee on Antarctic Research
SCAR MANUAL. Cambridge, Scott Polar Research Institute, 1966, 84p.
Q180.A6I5

Recommendations to the International Council of Scientific Unions (ICSU) that a permanent organization be established to sponsor a continuing Antarctic program after the end of the IGY resulted in the creation of the Scientific Committee on Antarctic Research (SCAR) as a permanent committee of the ICSU. This manual records the history and character of SCAR. Included is an account of the international scientific cooperation in the Antarctic since pre-IGY; the organization of and proceedings of SCAR; national organization of antarctic activities; stations operating in the Antarctic, winter 1966; and the text of the Antarctic Treaty.

A-11094
Académie des sciences, Paris. Comité national français des recherches antarctiques
REPORT NO.13 TO THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH. SCIENTIFIC ACTIVITIES FROM MARCH 1970 TO APRIL 1971 AND RESEARCH PROGRAMS PLANNED FOR DECEMBER 1971 TO DECEMBER 1972. Rapport No. 13 au Comité scientifique pour la recherche antarctique. Activités scientifiques de mars 1970 à avril 1971 et programmes de recherches prévus de décembre 1971 à décembre 1972. Académie des sciences, Paris. Comité national français des recherches antarctiques. Report to SCAR, June 1971 No.13, 50p., 75 refs.

This report to SCAR summarizes the nature of the research conducted at French stations during 1970 and 1971 by discipline, and lists the proposed programs for 1972. The programs were realized within the framework of the Terres Australes et Antarctiques Francaises and with the participation of Expeditions Polaires Francaises. A bibliography of publications on Antarctic research published since the previous annual report is included.

A-11095
Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research
REPORT TO SCAR ON NORWAY'S ANTARCTIC RESEARCH ACTIVITIES NOVEMBER 1970 - OCTOBER 1971; NORWAY'S ANTARCTIC RESEARCH ACTIVITIES PLANNED FOR NOVEMBER 1971 - OCTOBER 1972. Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research. Report to SCAR, November 1971, 3p., 12 refs.

During the 1970-1971 season six members from the Norsk Polarinstitutt carried out investigations in biology, geology, glaciology, gravimetry, and meteorology at H.U. Sverdrupfjella and Jutulstraumen in Dronning Maud Land. Neither wintering stations nor summer expeditions are planned for the 1971-1972 season.

A-11096
South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research
THIRTEENTH REPORT TO SCAR ON SOUTH AFRICAN ANTARCTIC RESEARCH ACTIVITIES DURING THE TWELVE MONTHS ENDED DECEMBER 1970, WITH A SUMMARY OF ACITVITIES DURING 1971 AND PLANNED FOR 1972. South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research. Report to SCAR, September 1971 No.13, 22p., C.S.I.R. Special report INFO 27, 34 refs.

This report to the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions provides information on the South African Antarctic Research Programs carried out during 1970, with a summary of the activities being carried out during 1971 and planned for 1972. Program lists show the station location, equipment and instruments used, type and schedule of observations, observation and computation procedure, and type of data resulting at SANAE Station, Marion and Gough Is. and aboard the Republic of South Africa. Membership of the South African SCAR and working groups is listed. Publications, in print and in preparation, relating to the South African programs are included.

A-11097
Royal Society of London. British National Committee on Antarctic Research
UNITED KINGDOM ANTARCTIC RESEARCH - 1971 REPORT. APRIL 1970 - MARCH 1971: RECORD OF ACTIVITIES. WINTER 1971: CURRENT ACTIVITIES. OCTOBER 1971 - SEPTEMBER 1972: PLANNED ACTIVITIES. Royal Society of London. British National Committee on Antarctic Research. Report to SCAR, Dec. 1971 No.13, 39p., 72 refs.
Q180.A1R68

This report outlines the scientific research

completed in the Antarctic from April 1970 until the departure of the last relief ship in the 1970-71 summer. The greater part is concerned with the work of the British Antarctic Survey, a component body of the Natural Environment Research Council. A tentative outline program of proposed research for 1972 is also included. Stations occupied during 1970 were located on Stonington I., Argentine Is., Signy I., Fossil Bluff, South Georgia, Adelaide I., and Halley Bay.

A-11098
Santiago de Chile. Instituto Antártico Chileno. Comité Nacional de Investigaciones Antárticas
CHILEAN COMMITTEE OF ANTARCTIC INVESTIGATIONS NATIONAL REPORT TO SCAR FOR THE YEAR 1971 OF ACTIVITIES FOR 1970-1971 AND PROGRAMS FOR 1972.
Comite Chileno de Investigaciones Antarticas Informe Nacional al SCAR - 1971: Actividades 1970-1971, Programas 1972. Santiago de Chile, Instituto Antartico Chileno. Comite Nacional de Investigaciones Antarticas. Report to SCAR, 1971. 23p., 27 refs.

This report summarizes the research conducted during 1971 at Chile's Frei, Prat, Cerda, O'higgins, Videla, Yelcho, and Guesalaga Stations and aboard the Piloto Pardo and Yelcho. The research is grouped by discipline and is listed in proposed programs for 1972. A bibliography of publications pertinent to research in Antarctica is included. Also included is a listing of members of the committee for investigations.

A-11100
South Africa. Weather Bureau
NEWS FROM SANAE AND THE ISLANDS. Nuus van SANAE en die eilande. Nuusbrief (News Letter), July 1971 No.268, p.117-119
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11101
South Africa. Weather Bureau
NEWS FROM THE ISLANDS. Nuusbrief (News Letter), Aug. 1971 No.269, p.140-141
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11142
Zotikov, I.
ANTARCTICA: MODEL OF COOPERATION. Soviet life, May 1972 No.5, p.46-50
DK1.U67

Last year was the first of a ten-year program called the International Antarctic Glaciological Project, which outlines the collaboration of the United States, Australia, France, and the Soviet Union in the exploration of Antarctica. The program of international cooperation on the Antarctic continent began in 1957 as part of the International Geophysical Year (IGY). During the IGY meteorologists, glaciologists, and geophysicists carried out a wide range of investigations the year round. In the course of these explorations, the participating nations established the admirable tradition of sharing results and exchanging specialists. The fruitful IGY contacts also formed the basis for the Antarctic Treaty which was signed on Dec. 1, 1959 and determined the future of the entire continent as a territory for exclusively peaceful uses. The author describes his gratifying experiences as an exchange scientist at McMurdo Station for a year. The International Antarctic Glaciological Project insures that the cooperative efforts of scientists from many different nations will continue.

A-11147
International Union of Geodesy and Geophysics
REPORT ON THE IUGG FIFTEENTH GENERAL ASSEMBLY. American Geophysical Union. Transactions, March 1972 53(3), p.228-248
QE500.A6

The 15th General Assembly of IUGG was held in Moscow, USSR, August 2-14, 1971. The results of the IUGG Council meetings are reported and the Association's reports of the interdisciplinary symposia are summarized. Topics of particular interest to polar regions study include ocean-floor spreading; energy fluxes over polar surfaces; cloud formation and dynamics; cloud nuclei and particle size distribution; global atmospheric research programs; geophysical test ground in the Antarctic; snow and avalanche studies; and observation tools and their applications.

A-11150
Johnson, C.
VANDA STATION LEADER'S REPORT FOR 1971/1972 SUMMER SEASON. Wellington, Ross Dependency Research Committee, Mar. 9, 1972, 9p.

Domestic and scientific activities at Vanda Station during the summer season from Oct. 27, 1971 to Feb. 9, 1972 are discussed. General domestic work included the building of a generator hut, interior decoration of the Mess hut, and the disposal of rubbish. Brief observations are made on power supplies, generators, fire protection, heaters, water supply, fuel, communications, health, food, and clothing, birds and seals, the lake moat, and the refuge hut in the lower Wright Valley. Scientific work continued on an electrostatic field mill, a blowing dust profile, and the meteorological program. Detailed directions are given for locating the meteorological screens in the Vanda region and a list of recommended clothing and gear for the persons making the screen changes is included.

A-11151
Buenos Aires. Instituto Antártico Argentino
NATIONAL REPORT TO S.C.A.R. ON ANTARCTIC SCIENTIFIC ACTIVITIES, YEAR 1971-72 AND PLANNED PROGRAM FOR 1973. Buenos Aires. Instituto Antártico Argentino. Report to SCAR, June 1972 No.14, 49p., 40 refs.
Q180.A6B8

The research programs accomplished at Belgrano, Brown, Orcadas, Petrel, Esperanza, Matienzo and Marambio Stations, two temporary stations and aboard the General San Martin, Bahia Aguirre, and Goyena are listed. The lists show the station location, equipment and instruments used, type and schedule of observations, computation procedures, and

resulting type of data. Summaries are given of research programs proposed for 1973. A bibliography of publications relating to the programs is included.

A-11152
Académie des sciences, Paris. Comité national français des recherches antarctiques
REPORT NO.14 TO THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH. SCIENTIFIC ACTIVITIES FROM MARCH 1971 TO APRIL 1972 AND RESEARCH PROGRAMS PLANNED FOR DECEMBER 1972 TO DECEMBER 1973. Rapport No. 14 au Comité scientifique pour la recherche antarctique. Activités scientifiques de mars 1971 à avril 1972 et programmes de recherches prévus de décembre 1972 à décembre 1973. Académie des sciences, Paris. Comité national français des recherches antartiques. Report to SCAR, June 1972 No.14, 54p., 88 refs.

This report to SCAR summarizes the nature of the research conducted at French stations during 1971 and 1972 by discipline, and lists the proposed programs for 1973. The programs were realized within the framework of the Terres Australes et Antarctiques Francaises and with the participation of Expeditions Polaires Francaises. A bibliography of publications on Antarctic research published since the previous annual report is included.

A-11153
Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research
REPORT TO SCAR ON NORWAY'S ANTARCTIC RESEARCH ACTIVITIES NOVEMBER 1971-SEPTEMBER 1972; NORWAY'S ANTARCTIC RESEARCH ACTIVITIES PLANNED FOR NOVEMBER 1972 - SEPTEMBER 1973. Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research, June 1972, 3p., 17 refs.

Three scientists from the Geophysical Institute, University of Bergen, will study the formation of Antarctic bottom water in the Weddell Sea. Wintering Stations were not in operation.

A-11154
National Academy of Sciences, Washington, D.C. Committee on Polar Research
REPORT ON UNITED STATES ANTARCTIC RESEARCH ACTIVITIES, 1971-72; UNITED STATES ANTARCTIC RESEARCH ACTIVITIES PLANNED FOR 1972-73. National Academy of Sciences, Washington, D.C. Committee on Polar Research. Report to SCAR, June 1972 No.14, 82p., 98 refs.

Summaries are given of U.S. Antarctic activities from Feb. 1971 to March 1972 in the atmospheric, earth, and biological sciences. Research vessel observations and operations of the Eltanin, Hero, and Southwind are included in the cruises tabulated. Activities of the Polar Information Service, NSF are outlined. Activities in progress during March to Oct. 1972 and activities planned for Oct. 1972 through Sept. 1973 are listed. Subcenters of World Data Center A, U.S. Stations and Scientific Personnel, and U.S. membership of the Committee on Polar Research and SCAR working groups are also listed. A bibliography is given of selected publications on U.S. Antarctic research.

A-11159
South Africa. Weather Bureau
NEWS FROM SANAE AND THE ISLANDS. Nuus van SANAE en die eilande. Nuusbrief (News Letter), September 1971 No.270, p.148-150
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11160
South Africa. Weather Bureau
NEWS FROM THE ISLANDS AND SANAE. Nuusbrief (News Letter), October 1971 No.271, p.164-166
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctica.

A-11163
THE NATIONAL DIRECTOR. El director nacional. Antártida, Dec, 1971 No.1, p.6, In Spanish.

This brief description of the experience of Brigadier General Jorge Edgar Leal, national director of the Direccion Nacional del Antartico, includes mention of his managing Esperanza, San Martin, and Belgrano Stations at various times from 1953 to 1957, attending Antarctic Treaty meetings, and, from 1958 to 1969, commanding Antarctic field operations. He attained his present rank in December, 1969.

A-11164
SCIENTIFIC ACTIVITIES IN THE ANTARCTIC, 1970-1971. PLAN OF ACTIVITIES FOR 1972. Actividades cientificas antárticas año 1970-1971. Plan de actividades para 1972. Antártida, Dec., 1971 No.1, p.8-15, In Spanish.

Charts are presented summarizing the location, personnel, and scientific activities of Argentine bases in the Antarctic. Climatological data and equipment for the bases are also given, along with a plan of activities for 1972 and a chart of Argentine institutions, describing their involvement in Antarctic research.

A-11166
Basbous, J.
FIRST RADIOTELEPHONE CONTACT FROM THE ANTARCTIC. Primer contacto radiotelefonico desde el Antártico. Antártida, Dec, 1971 No.1, p.18-21, In Spanish.

The first radio contact from the Antarctic (from Orcadas to Usuhaia) occurred on April 1, 1940 at 14,050 kilocycles using the LU 7 ET transmitter. This breakthrough symbolized the end of the isolation of Antarctica. Description of related personalities and equipment is included.

A-11167
MEN AND ACHIEVEMENTS: REAR ADMIRAL GREGORIO A. PORTILLO (1897-1970. Hombres y gestas: Contraalmirante Gregorio A. Portillo (1897-1970. Antártida, Dec, 1971 No.1, p.22, In Spanish.

Rear Admiral Gregorio A. Portillo was Governor of Teirra del Fuego (1944-1945) and culminated a military career as Commander of Naval Aviation (1947-1949). He helped plan the

Gran Expedicion Naval Antartica (1947) and in Dec., 1947 his flight in a Douglas C-54 to the South Pole from Santa Cruz, significantly contributed to Argentina's activities in the Antarctic.

A-11169
ANTARCTICA: TOURIST CRUISES. Antartida: cruceros turisticos. Antártida, Dec, 1971 No.1, p.32-35, In Spanish.

Antarctic boat tours from Argentina are becoming increasingly popular, with close to 900 tourists going to Antartica during the 1968-1969 summer season. The Argentine Direccion Nacional de Turismo is conducting a campaign to increase the popularity of these trips.

A-11170
NATURE IN ANTARCTICA - GENERALITIES. Naturaleza antartica - generalidades. Antártida, Dec, 1971 No.1, p.36-41, In Spanish.

A general review of Antarctica describes the meteorological, biological, and geological conditions of the continent. In relation to the Antarctic atmosphere, ocean, and flora and fauna, particular emphasis is given to the food chain of the land, surrounding sea, and ice cover of the area.

A-11175
South Africa. Weather Bureau
NEWS FROM SANAE AND THE ISLANDS. Nuus van SANAE en die eilande. Nuusbrief (News Letter), November 1971 No.272, p.174-176
QC851.S82

The report contains news of scientific work performed, station maintenance, balloon ascents; weather statistics; and general remarks on malfunctioning equipment, unusual situations, and so forth. These activities of South Africa are on Marion and Gough Is. and SANAE Station, Antarctic.

A-11181
Kingwill, D.G.
FIRST TEN YEARS OF SOUTH AFRICAN ANTARCTIC RESEARCH. South African journal of antarctic research, 1971 No.1, p.2

South African interest in antarctic research dates back many years. During the International Geophysical Year (IGY) 1957/58, this found expression in participation in the British Commonwealth Trans-Antarctic Expedition under Sir Vivian Fuchs, and acceptance by South Africa of responsibility for the southern atmosphere weather analysis project. South Africa was one of the 12 member nations of the Scientific Committee for Antarctic Research (SCAR) and a signatory to the Antarctic Treaty. Two South African stations are maintained in Antarctica; SANAE, built in 1962, and Borga Base, an inland wintering-over station established in 1969. South African antarctic activities are managed by the Department of Transport which is responsible for maintaining weather observing stations on Marion I., Gough I., and at SANAE. The Department has also acquired its own relief vessel, the M.S. RSA. In addition to a full range of weather observations, research studies include programs on the ionosphere, cosmic rays, the airglow, geomagnetics, meteorology, the earth sciences, and biology. Limited activities are also being carried out in cartography, oceanography, and human sciences.

A-11193
Buenos Aires. Instituto Antartico Argentino
DIRECTIVES FOR THE ANTARCTIC SUMMER PROJECT CAVIAA 1967-1968. Directivas para la campana antartica de verano CAVIAA 1967-68. Sept. 1967, 11p., In Spanish

An outline of the plans for Argentine summer activities in the Antarctic includes: expansion of the research capabilities of the Almirante Brown and General Belgrano Stations, general research, and increasing the collection of specimens for the Instituto Antartico Argentino. Specific studies are concerned with the aves, mammalia, and pisces at Paradise Harbor with emphasis on penguin physiology. Construction programs at the two stations, personnel lists and procedurals directives are included.

A-11194
Buenos Aires. Instituto Antártico Argentino
DIRECTIVES FOR THE ANTARCTIC WINTER PROJECT CINIAA 1968 - ALMIRANTE BROWN SCIENTIFIC STATION. Directivas para la campaña antártica de invierno CINIAA 1968 - Estación Cientifica Almirante Brown. Sept. 1967, 11p., In Spanish.

An outline of research plans for the Almirante Brown Station covers the following objectives: investigation of local biology, human physiology, animal endocrine gland research, biochemical research on man in the Antarctic, initiation of attempt to obtain antiserum for humans from antarctic animals. Other secondary objectives, experimental procedures, and routine operations in several disciplines are also outlined. The administrative, housekeeping, and directive functions are briefly described.

A-11195
Buenos Aires. Instituto Antártico Argentino
DIRECTIVES FOR THE ANTARCTIC SUMMER PROJECT CAVIAA 1969-1970. Directivas para la campaña antártica de verano CAVIAA 1969-70. Sept. 1969, 9p., In Spanish.

An outline of summer research in the Antarctic lists studies in histology of seals, aves and protozoa, microbiology and biology of fauna near Brown Station; petrofabrics, paleomagnetism and volcanism at Deception Island; and cosmic rays aboard the General San Martin. Maintenance and materiel requirements are summarized for Belgrano and Brown Stations. Administrative and operating directives to be followed by all personnel are included.

A-11196
Buenos Aires. Instituto Antártico Argentino
DIRECTIVES FOR THE ANTARCTIC WINTER PROJECT CINIAA 1969 - GENERAL BELGRANO STATION. Directivas para la campaña antártica de inverno CINIAA 1969 - Base General Belgrano. Sept. 1968, 14p., In Spanish.

Research plans for the General Belgrano Station include auroral observations, ionospheric absorption investigations, and study of solar-terrestrial relationship. Analytical methods, equipment, film development procedures administrative action, and station maintenance are summarized.

A-11197
Buenos Aires. Instituto Antártico Argentino
DIRECTIVES FOR THE ANTARCTIC WINTER PROJECT

CINIAA 1970 - GENERAL BELGRANO STATION. Directivas para la campaña antarctica de invierno CINIAA 1970 - Base General Belgrano. Sept. 1969. 12p., In Spanish

The scientific program at Belgrano Station for the winter of 1970 covers cosmic radiation, ionospherics, aurora, radioactivity, and meteorology. Administrative and regulatory directives, manuals, instructions, and technical papers relating to the investigations being undertaken are given for general guidance of the station complement.

A-11198
Buenos Aires. Instituto Antártico Argentino. Dirección Nacional del Antártico
SUMMARY OF ANTARCTIC SCIENTIFIC PROGRAMS - SUMMER 1971, 1972, AND WINTER 1972 PROJECTS. Resumen de programas cientificos antárticos - campaña de verano 1971/72 y campaña de invierno 1972. Oct. 1971, 3p., In Spanish.

An outline of Argentine activities in the Antarctic during the summers of 1971 and 1972 and the winter of 1972 is presented. Programs, locations, duration, personnel, and responsible institutions are given for research in the earth, biological, and atmospheric sciences.

A-11199
Buenos Aires. Instituto Antártico Argentino. Dirección Nacional del Antártico
ACTIVITIES OF THE REPUBLIC OF ARGENTINA IN ANTARCTICA DURING THE 1971-1972 SEASON AND THE YEAR 1972. Actividades de la Republica Argentina en la Antártida durante la temporada 1971/72 y año 1972. 101p., In Spanish.

The activities of Argentina in the Antarctic during 1971 and 1972 are summarized. Equipment, personnel, and scientific programs at Stations Belgrano, Brown, Esperanza, Marambio, Tenieute Matienzo, Orcadas, and Petrel and aboard the General San Martin, Bahia Aguirre, and Goyena are given. The telecommunications schedule for 1972 is tabulated for each station.

A-11221
Mougey, M.
RAILROAD MAN IN ADELIE LAND. Un cheminot en Terre Adélie. Vie du rail, Aug. 29, 1971 No.1305, p.34-38, In French.

Lucien Caillot, a member of the 19th French Polar Expedition (1968-1969) based at Adelie Land, gives introductory comments of interest mostly to people unfamiliar with the intensity of scientific research, the potential economic value (negligible at present because of the high cost of exploitation), and the problems of acclimatization to the forbidding environment of Antarctica. Caillot went to Antarctica to aid in testing vehicles on ice because of his mountain and railroad experience. Glaciological, meteorological, and seismological studies were also made.

A-11227
Gonzalez Ferran, O.
SCIENTIFIC EXPEDITION IN MARIE BYRD LAND. Travesia cientifica en la Tierra de Maria Byrd. Instituto Antártico Chileno. Boletín, 1969 No.4, p.29-34, In Spanish.

During the summer of 1967-1968 under the auspices of the US Antarctic Research Program, geological studies were made in Marie Byrd Land. The structure, petorgraphy, and stratification of outcroppings were examined in order to correlate Marie Byrd Land mountains with the Transantarctic and Ellsworth Mts. Petrographic and tectonic studies of the area's Cenozoic volcanoes (which make up 80 per cent of the total) were made from Hobbs Coast to Bakutis Coast. Topographic measurements were carried out and two astronomical stations for photography were set up. Personnel, daily activities, and logistics of the expedition are described.

A-11229
Hermosilla R., W.
ANTARCTIC ROOM IN THE NATIONAL MUSEUM OF NATURAL HISTORY. Sala antartica en el Museo Nacional de Historia Natural. Instituto Antártico Chileno. Boletin, 1969 No.4, p.36-37, In Spanish.

The Chilean National Museum of Natural History is dedicating a room to the permanent display of geographical, geological, and biological materials from Antarctica with the specimens in their natural habitat. Specimens will come from INACH expeditions and later from international exchange. The room is to be completed in 1970 and the creation of a duplicate display in Santiago has been proposed. Ultimately, it is hoped that Antarctic displays will be included in all the natural history museums of Chile.

A-11281
Gonzalez Ferran, O.
CONTRIBUTION OF CHILE TO GEOLOGICAL KNOWLEDGE OF ANTARCTICA. Contribución de Chile al conocimiento geologico del continente Antártico. Instituto Antártico Chileno. Boletín, 1970 No.5, p.21-25, 37 refs.

Since its creation in 1964 the Instituto Antartico Chileno has conducted a vigorous research program in Antarctica. Geology - stratigraphy, paleontology, volcanology, geochronology - has been stressed. Cenozoic volcanoes in western Antarctica which are responsible for the area's present morphology were studied. Bursey Volcano was dated at 3.8 million years old by the potassium-argon method. Intrusions on Thurston Island were dated at 240 m. y. by the rubidium-strontium method. Volcanic activity on the S. Sheltand Is. was found to migrate from northeast to southeast and in Marie Byrd Land from north to south. Fossils in the South Shetland Is. - including tracks of birds of the Rallidae Family dating from the Oligocene and various types of invertebrate fossils some 130 m. y. old - were examined. Photographs of fossils, terrain, geological formations, and volcanoes in the areas INACH has worked in are included.

A-11287
Krutskikh, B.A.
BASIC TRENDS IN THE SCIENTIFIC RESEARCH OF THE ARCTIC AND ANTARCTIC RESEARCH INSTITUTE IN THE NINTH FIVE-YEAR-PLAN. Osnovnye problemy nauchno-issledovatel'skikh rabot AANII v deviatoi piatiletke. Problemy Arktiki i Antarktiki; Sbornik statei, 1972 Vol.39, p.5-10, In Russian.
G575.L422

Scientific research programs in glaciology, oceanography, meteorology, geophysics and geography planned by the Arctic and Antarctic Scientific Research Institute in the Arctic and Antarctic for the 1971 - 1975 period are discussed. An account of the activities of the Institute in the past is briefly summarized. To obtain more precise information and to determine physical changes occurring in the polar regions further large-scale studies are suggested.

A-11379
Allefresde, M.
POLAR REGIONS. Régions polaires. Bibliographie géographique internationale, 1969 Vol.75, p.916-941
Z6001.B57
Included in the bibliography is section G on Polar Regions, a limited collection on the physical and human geography of Greenland, Canada, Alaska, USSR, Scandinavia, and the Antarctic. Some citations relating to meteorology, hydrology, glaciology, pedology, and associated fields are given for cold regions other than polar.

A-11404
BRITISH ANTARCTIC INSTITUTE. El Instituto Antártico Britanico. Buenos Aires. Instituto Antártico Argentino. Boletín, Nov. 1965 2(18), p.11-14, In Spanish.
The British Antarctic Institute, directed by Sir Vivian Fuchs maintains atmospheric physics and meteorological observation programs, does geological and topographical research, and makes maps of 1:500,000 or larger scales. Biological studies have now been made easier by the establishment of a biological laboratory. Personnel, program, and general information on Adelaide, Argentine, Stonington, Deception Islands and Halley Bay Stations is given.

A-11405
Gerster, G.
MAN IN THE ANTARCTIC. Uomini nell'Antartide. Vie del mondo, June, 1966 No.6, p.544-556, In Italian.
A general review of Antarctica with emphasis on life at McMurdo Station and on various terrain features and ice formations is given. General international research efforts and the specific capabilities of Byrd Station are discussed. Good photographs of McMurdo Station and various ice formations are included.

A-11406
Chatellus, A. de
SUPERMEN OF YESTERYEAR: AMUNDSEN IN THE POLAR REGIONS. Surhommes d'autrefois: Amundsen dans les régions polaires. Montagne et alpinisme, Dec. 1967 No.65, p.164-172, In French.
Amundsen's trips through the Northwest Passage and to the South Pole are reviewed. Equipment, terrain, and competition from other explorers are discussed. The article is well illustrated with photographs of the terrain and Amundsen's expedition.

A-11408
Gerster, G.
VISA TO ANTARCTICA, PARTS I AND II. Visa pour l'Antarctique. Illustré, March 24, 31, 1966 No.12,13, p.59-68, 59-70, In French.
Conditions in Antarctica are reviewed with emphasis on the contrasts between the natural environment and the comforts of McMurdo Station. Descriptions of scientific investigations and the life at both McMurdo and Byrd Station are well illustrated with photographs.

A-11409
Gerster, G.
SOUTH POLE. Sudpol. Kristall, 1966 No.2, p.56-65, In German.
General information on terrain, research efforts, life of scientists, and fauna in the Antarctic is given, accompanied by many photographs.

A-11415
N.Z. RESEARCH PROGRAMME INCREASED FOR 1972-73. Antarctic, June 1972 6(6), p.186-187
G845.A55
New Zealand will be involved in two long-term international projects in the 1972-73 season -- the Ross Ice Shelf drilling project and the dry valley project. Next season's program will include work at Scott Base, Vanda Station, Ross I., the dry valleys, the Trans-Antarctic Mountains, and Northern Victoria Land. Scott Base will continue to be the center of activity for studies in radio, auroral and atmospheric physics, geomagnetism, and seismology, and the center for much of the field activity. Vanda Station will be a base for summer activities in the dry valleys region and meteorological studies. Antarctica's two known active volcanoes, Mt. Erebus and Mt. Melbourne will also be studied. Work in the dry valleys region will include water and soil studies, glaciological and geological investigations. Sedimentation rates and trace element migration along the Ross Ice Shelf will be examined and the drill hole project will permit the study of the McMurdo Sound ice margin to extend the investigation of currents and associated plankton. Biological parties will continue investigations of marine benthic ecology, plankton, penguins, skuas, and seals.

A-11417
WHO WAS ANTARCTIC ARCHER IN BYRD'S EXPEDITION?. Antarctic, June 1972 6(6), p.189
G845.A55
Canterbury Museum queries the original ownership and use of an arrow during Byrd's 1933-35 expedition, at the time of donation. It is possible that someone in the expedition decided that penguins or skuas might be killed more easily with a bow and arrow. Other unusual items found in the Antarctic over the years have included a dozen strait-jackets, cough syrup and cough drops, a still, two bales of horsehair, and a case of Lydia Pinkham's vegetable compound.

A-11420
ITALIAN PLAN TO SEND TEAM SOUTH IN 1973-74 SEASON. Antarctic, June 1972 6(6), p.196
G845.A55
A small Italian scientific and mountaineering team which worked with the New Zealanders in the 1968-69 season has indicated the desire to participate in New Zealand's Antarctic research program in the 1973-74 season. Italy's first Antarctic project was the result of a decision by the Ross Dependency Research Committee that some support be given to small groups from countries which are not concerned in the Antarctic Treaty, provided that logistic support was available. Four Italians were then invited to work at Scott Base in the 1968-69 summer to gain knowledge and experience of New Zealand's scientific work. The group worked with geological parties in the Boomerang Range, helped in the construction of Vanda Station, and made a documentary film for Italians to gain a knowledge of Antarctic conditions.

A-11423
Jones, A.G.E.
FIRST INTO THE ROSS SEA. Antarctic, June 1972 6(6), p.201-204, 14 refs.
G845.A55

It is generally agreed by Antarctic historians that in Dec. 1840, Sir James Ross was the first to sail into the sea named after him. It now appears possible that Ross was forestalled by about ten years by Samuel Harvey who took command of the Venus in Liverpool in June, 1830, and in a second voyage sailed from Sydney on Jan. 8, 1831, with whaling stores for the sperm fishery, returning on Dec. 31, 1831 with 140 tons of black oil and 30 tons of sperm oil. Harvey later wrote that he had proceeded as far south as 72 deg S. Details of the voyage were recorded in his log book which was destroyed. A probable reconstruction of the voyage makes it appear likely that Harvey reached lat. 72 deg S and about Long. 180 deg in the Ross Sea. Capt. Harvey continued in the South Seas trade and was probably alive in the middle of the 19th century when interest in Antarctic exploration was growing, but nobody thought to record his account of what he had done.

A-11425
MUSEUM ARCHIVES CONTAIN INTERESTING LETTERS. Antarctic, June 1972 6(6), p.215
G845.A55

Original letters by Shackleton and Thomas Whitfield, one of the crew of the Discovery, have been added to the archives of the Canterbury Museum. Shackleton's letter was written aboard the Nimrod on Jan. 21, 1908, and Whitfield's letter was written from South Victoria Land on Feb 24, 1903. Whitfield's letter, written from Winter Quarters Bay, where the Discovery was locked in the ice, expressed doubts on whether the ship would be able to clear the ice barrier. Shackleton's letter, written two days before the Ross Ice Shelf, then the Great Ice Barrier, was sighted from the Nimrod, was to thank Canterbury farmers for the 32 live sheep they had given to the expedition.

A-11428
Von Braun, W.
SPACE MAN'S LOOK AT ANTARCTICA. Popular science, May 1967 190(5), p.114-116, 200
AP2.P8

A visit to the South Pole and U.S. research bases in Antarctica by NASA leaders seeking lessons for lunar missions leads to the conclusion that both scenes have much in common and that facets of Antarctic operations of particular interest for the space program include 1) station leadership, i.e., a Station Scientific Leader to coordinate scientific activities and an Officer-in-Charge to handle the safety and support of personnel; 2) fall-back camps to provide emergency shelter, food, and medical supplies; 3) prefabricated stations; 4) surface vehicles for various purposes; and 5) the space studies in progress in the Antarctic. Satellite data are continuously being recorded by a Doppler tracking station at McMurdo, and microbiological field studies are being carried out in the dry valleys in preparation for the Voyager spacecraft project.

A-11437
Tkachev, V.
CAPTAIN OF THE FLAGSHIP OF ANTARCTIC EXPEDITIONS. Kapitan flagmanskogo korablia antarkticheskikh ekspeditsii. Morskoi flot, 1972 No.6, p.25. In Russian.
VM4.M6

Activities of the captain of the Ob', Eduard Iosifovich Kupri, during his voyages to and from Antarctica since 1965 are briefly described.

A-11440
ALMIRANTE BROWN SCIENTIFIC STATION. La Estación Cientifica Almirante Brown. Buenos Aires. Instituto Antártico Argentino. Boletín, May 1965 2(17), p.3-9, In Spanish.

Personnel, living quarters, laboratory equipment, and scientific activities planned for 1965 are concisely described. Five pages are devoted to photographs of the station and a map.

A-11461
Avsiuk, G.A. , Kartashov, S.N.
PROSPECTIVE PLAN OF SOVIET ANTARCTIC STUDIES FOR 1971-1975 (GENERAL INFORMATION). Perspektivnyi plan sovetskikh issledovanii Antarktiki 1971-1975 gg. (obshchaia informatsiia). Antarktika; doklady komissii, 1969, pub. 1971, p.181-185, In Russian.
G576.A65

A prospective plan of Soviet studies in the Antarctic during the 1971-1975 period is given. Scientific approaches directed to further development of investigations and increased effectiveness are discussed. A list of standard observations to be made for supplying data systematically to hydrometeorological and geophysical services and of standard measurements to be made for all scientific studies in the Antarctic are described.

A-11481
McKinnon, G.W.
AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITIONS. J.L. news, Oct. 1971 No.74, p.6-9

The research and exploratory efforts of both early Australians and the Australian National Antarctic Research Expeditions (ANARE) are briefly reviewed.

A-11482
Amaro, M.
SYMBOL OF GOOD WILL: THE ANTARCTIC TREATY. Americas, Feb. 1967 19(2), p.1-9

Topics discussed at the Fourth Antarctic Treaty Consultative Meeting held in Santiago, Chile during November, 1966, and the accomplishments of the original 1959 Treaty are reviewed. Fifteen sanctuaries for flora and fauna were set up. It was agreed that information would be exchanged more freely, including making meteorological data automatically available. It was suggested that tourism be regulated in order that it not interfere with research.

A-11528
Royal Society of London. British National Committee on Antarctic Research
UNITED KINGDOM REPORT ON ANTARCTIC RESEARCH 1968/1970. SUMMARY OF SCIENTIFIC WORK COMPLETED IN THE ANTARCTIC DURING 1968 AND PROVISIONAL PLANS FOR 1970. Royal Society of London. British National Committee on Antarctic Research. Report to SCAR, Nov. 1969 No.11, 36p., 79 refs.
Q180.A1R68

This report outlines the scientific research completed in the Antarctic from April 1968 until the departure of the last relief ship in the 1968-69 summer. The greater part is concerned with the work of the British Antarctic Survey. A tentative outline program of proposed research for 1970 is also included. The following stations were occupied during 1968: Deception Island, Stonington Island, Argentine Islands, Signy Island, Fossil Bluff, Adelaide Island, Halley Bay, and South Georgia. A list of centers of biological research and antarctic publications is given.

A-11529
Japan. Science Council. National Antarctic Committee
NATIONAL REPORT ON JAPANESE ANTARCTIC RESEARCH ACTIVITIES. COMPLETED PROGRAMMES FOR 1969-1970 AND PROPOSED PROGRAMMES FOR 1971. Tokyo, June 1970, 34p., 44 refs.

The report outlines the scientific research completed at Showa Station from Feb. 1969 to Jan. 1970, and on board the icebreaker Fuji in the 1969-70 summer. Observations were carried out by the 10th Japanese Antarctic Research Expedition (JARE-10) and JARE-11 had taken over on Feb. 20, 1970. The report also provides a tentative program of proposed research for the 1970-71 summer and 1971 winter at Showa Station and on board the Fuji, as well as a new program in the dry valleys of Victoria Land.

A-11530
Royal Society of New Zealand. National Committee for Antarctic Research
SUMMARY OF RESEARCH PROGRAMMES, 1970 AND PROPOSED RESEARCH PROGRAMMES, 1972. Royal Society of New Zealand. National Committee for Antarctic Research. Report to SCAR, June 1971 No.13, 18p., 19 refs.
Q180.A6N4

The report outlines the scientific research completed at Cape Bird, Scott, and Vanda Stations and aboard the Endeavour, and the RNZAF C130H aircraft flights during the 1970 winter and 1970/1971 summer in the atmospheric, earth, and biological sciences. The proposed program for the next season is summarized. A list of the N.Z. members of the SCAR working groups and a bibliography of antarctic literature are also given.

A-11531
Treshnikov, A.F.
ARCTIC AND ANTARCTIC SCIENTIFIC RESEARCH INSTITUTE. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Leningrad, Gidrometeoizdat, 1970, 25p.

Activities and accounts of the Arctic and Antarctic Scientific Research Institute in oceanographic, meteorological, glaciological, geophysical and medical studies carried out in the Arctic since 1925 and in the Antarctic since 1956 are reviewed. The use of new equipment in laboratories, including computers, for fast and complete analyses of data obtained from the polar regions is noted. On the 50th anniversary of the USSR, the institute was awarded the Order of Lenin.

A-11532
Llano, G.A.
TRIBUTE TO WALDO LASALE SCHMITT. Biological Society of Washington. Bulletin, 1972 No.2, 6p., Includes response.

The accomplishments of Waldo L. Schmitt are briefly reviewed. He served as oceanographic and marine biological advisor to the Committee on Polar Research of the National Academy of Sciences from 1959 to 1966, and worked in Antarctica during part of this period, collecting insects and other organisms in the Antarctic moss and lichens, fish, and other specimens, particularly polychaetes, ascidians, and mollusks. He has also worked on the Antarctic Research Series.

A-11534
Waalwijk, J.M.
ROUND TRIP TO THE SOUTH POLE. Retour Zuidpool. Mondiaal, Aug. 1970 No.2, p.30-35, In Dutch

A popular account is given of American activities and research programs in the Antarctic and especially at McMurdo and Amundsen-Scott Stations. International cooperation and the geography, climatology and oceanography of the Antarctic are briefly discussed.

A-11544
SCIENTIFIC RESEARCH IN THE FRENCH SOUTHERN AND ANTARCTIC TERRITORIES: OUTLINE OF THE SIXTH PLAN. La recherche scientifique dans les Terres Australes et Antarctiques Francaises: Project pour le Sixieme Plan. Paris, TAAF, 1970, 64p., In French.

France's Sixth Plan for Antarctic research is described. Research is divided into four major groups: external geophysics, internal geophysics and geology, biology, and oceanography; the plan in each area is given in detail. Financial arrangements and materiel are included.

A-11557
Guthridge, G.G.
U.S. ANTARCTIC RESEARCH PROGRAM, 1971-1972. REVIEW OF THE SUMMER SEASON. Antarctic journal of the United States, July-Aug. 1972 7(4), p.69
G845.A56

The 1971-72 summer of U.S. activity in Antarctica extended from Aug. 31, when the first plane landed on the ice of McMurdo Sound, until Mar. 31, when the Hero left Palmer Station. In the intervening 7 mo 158 investigators under the auspices of the National Science Foundation carried out research at all seven U.S. stations; at field locations in Marie Byrd Land, southern Victoria Land, and the Antarctic Peninsula; and aboard the Hero and the icebreakers Southwind, Northwind, and Staten I. The Eltanin continued a series of cruises that eventually will lace the entire Southern Ocean and a Robert D. Conrad cruise extended well into antarctic waters south of the Drake Passage. The largest single program this season was the many-disciplined Dry Valley Drilling Project. Other scientific programs included studies in biology, the earth sciences, the atmospheric sciences, and oceanography. Logistic support was provided by the Navy, Coast Guard, and Air Force.

A-11611
Zavatti, S.
NOTES ON COMMERCIAL TRANSANTARCTIC AIRLINES. Alcune note sulle linee commerciali transantartiche. Rivista aeronautica, astronautica, missilistica, Oct. 1971 47(10), p.1811-1815, In Italian.

The feasibility of establishing

intercontinental transantarctic commercial airline routes, such as the Scandinavian Airlines System idea of flying between Africa and New Zealand over Antarctica, is discussed. Tourist flights into McMurdo Station also receive consideration. Economics, the views of the US Defense Department, and legal issues related to tourism are discussed.

A-11618
Trojani, F.
R.E. AMUNDSEN - HERO OF THE POLAR ICE. R.E. Amundsen - l'eroe dei ghiacci polari. Milan, U. Mursia, 1971, 157p., In Italian.

The explorations of Roald Engelbert Amundsen are described in this biography intended for the general reader. On pages 17-28 his first voyage to Antarctica, 1897-1899, is discussed. Amundsen's trip to the South Pole in 1911 is described on pages 49-67. The remainder of the book describes Amundsen's explorations in the Arctic.

A-11640
Royal Society of New Zealand. National Committee for Antarctic Research
SUMMARY OF RESEARCH PROGRAMMES, 1971 AND PROPOSED RESEARCH PROGRAMMES, 1973. Royal Society of New Zealand. National Committee for Antarctic Research. Report to SCAR, 1972 No.14, 18p., 45 refs.
Q180.A6N4

Summaries are given of New Zealand Antarctic activities in 1971 winter and 1971/1972 summer. The principal observations carried out in atmospheric, earth and biological sciences at Scott, Cape Bird, and Vanda Stations are outlined and the proposed program for 1972/1973 summer and 1973 winter is summarized. The programs are formulated by the Ross Dependency Research Committee which, in a non-governmental capacity as a committee of the Royal Society of New Zealand, constitutes the N.Z. National Committee on Antarctic Research. The programs are implemented by the Antarctic Division of the Department of Scientific and Industrial Research. Members of committees and working groups are listed and a bibliography of antarctic literature published is given.

A-11646
Japan. Science Council. National Antarctic Committee
NATIONAL REPORT ON JAPANESE ANTARCTIC RESEARCH ACTIVITIES FOR 1972. COMPLETED PROGRAMMES: FEBRUARY 1971-JANUARY 1972. PROPOSED PROGRAMMES: NOVEMBER 1972-JANUARY 1974. Tokyo, June 1972, 31p., Refs. p.15-21

The report outlines the research completed at Showa Station from February 1971 to January 1972, and on board the Fuji during 1971-1972 summer. The work completed at Lake Vanda is also included. JARE-13 took over Showa Station on February 20, 1972, relieving JARE-12 of the research work at Showa and Mizuho Camp. The proposed program from November 1972 to January 1974 at Showa Station and on board the Fuji, as well as in the dry valleys of Victoria Land in the summer of 1972-1973 is given. A bibliography includes current literature published pertinent to the Antarctic.

A-11648
Pomerantz, M.A.
INTERNATIONAL YEARS OF THE QUIET SUN, 1964-65. Science, Nov. 29, 1963 142(3596), p.1136-1143, 11 refs.

Factors that stimulated the IQSY program are reviewed. The IQSY is described as a sequel to the IGY: an effort to comprehend events discovered during the IGY, particularly as related to solar corona size, flare activity, and sunspot frequency. But the IQSY's concept goes far beyond solar study to encompass atmospheric studies above 100 mb, geomagnetic fluctuations (especially in the higher frequencies), Lyman-alpha airglow from the hydrogen geo-corona, ionospheric physics, and radio astronomy. Cosmic ray studies will be given considerable emphasis, with monitoring of the electron density in the D region a major project. It is also proposed that balloons be launched in the Arctic to study the polar vortex.

A-11649
Fuchs, V.E.
BRITISH ANTARCTIC SURVEY. Great Britain. Natural Environment Research Council. Report for the period 1 April 1971-31 March 1972, London, Her Majesty's Stationery Office, 1972, p.96-102

The work of the British Antarctic Survey is co-ordinated with that of other signatories to the Antarctic Treaty under the aegis of the Scientific Committee on Antarctic Research of the International Council of Scientific Unions. During the year seven stations have been maintained within the British Antarctic Territory and the Falkland Islands Dependencies. Of the six within the Territory, two have comprised geophysical observatories, one has been entirely devoted to biological studies and another to glaciology. Two others support field activities in geology, glaciology and topographical survey. The Dependencies station at South Georgia has had a joint geophysical, geological, glaciological and biological function.

A-11661
Nickels, S. comp
SCOTT AND THE DISCOVERY OF THE ANTARCTIC. Jackdaw, No.123, London, Ebenezer Baylis & Son, 1972, 6p. + 8 exhibits, 7 refs.

This Jackdaw contains 8 exhibits, 4 broadsheets, and 6 pages of notes describing Scott's Antarctic journeys. The exhibits include: 1) a map of Antarctica showing the route of the major Antarctic expeditions; 2) a water-color of Antarctic scenery by Dr. Edward Wilson, a member of Scott's expedition; 3) the final pages from Capt. Scott's polar diary; 4) two pages from the ornithological log book kept by Wilson with drawings of the Adelie penguin; 5) extracts from the diary of Capt. Worsley, describing the sinking of the Endurance, the ship which carried Shackleton's expedition; 6) Survival in the Antarctic -- a picture strip; 7) Antarctic Transport -- a picture strip; and 8) pages from the Antarctic Treaty. The broadsheets are entitled 1) Antarctica; 2) The Curtain Rises; 3) The Heroic Age; and 4) The I.G.Y.

A-11662
Australia. Department of Supply. Antarctic Division
ANNUAL REPORT -- 1970-71. Melbourne, Victoria, Defence Printing Establishment, [1971], 66p., 39 refs.

The report covers a vast number of projects. Atmospheric physics studies included Faraday rotation electron content analysis, magnetospheric modelling, satellite analysis of electron flux, ionospheric studies, and

considerable emphasis on cosmic ray studies, including construction of a high energy observatory at Mawson. Glaciological studies were aimed at ice distribution and movement of the ice sheet with emphasis on numerical modelling, glacial dynamics and mass balance estimates for Wilkes Ice Cap. Energy fluxes accompanying sea ice formation (data included) and oxygen isotope analysis of ice cores were major programs. Biological studies emphasized giant petrel and albatross breeding, bull elephant seal social status, and littoral ecology of Macquarie Island. Human acclimatization to cold was the subject of the final study examined here in detail. Scientific instruments, ship logistics, and personnel data are also included.

A-11724
DeGoes, L.
RECENT ACTIVITIES OF THE COMMITTEE ON POLAR RESEARCH. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.209-210
G845.A56

International activities of the Committee during this period included representation at the Convention for the Conservation of Seals held in London, Feb. 1972; participation in planning for the Second International Permafrost Conference to be held in Yakutsk, USSR, in 1973; and arranging for foreign scientists to participate in the first international reindeer/caribou symposium at the University of Alaska, Aug. 9-11, 1972. The Committee is to assist the National Science Foundation's Office of Polar Programs in formulating research priorities for Antarctica over the next 10 to 12 yr. The activities of the panels on upper atmospheric physics, biological and medical sciences, glaciology, and antarctic oceanography, are summarized. A joint panel reviewed the Arctic Ice Dynamics Joint Experiment.

A-11726
Alberts, F.G.
ANTARCTIC GEOGRAPHIC NOMENCLATURE. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.211-212
G845.A56

In the past year the Advisory Committee on Antarctic Names (ACAN) recommended new names at South Georgia, in the South Sandwich Islands, the South Shetland Islands, the Antarctic Peninsula, Victoria Land, the Transantarctic Mountains, Marie Byrd Land, and other scattered points of the continent. Approximately 1,000 new names and 25 amendments have been authorized since publication in 1969 of the last cumulative list for Antarctica, BGNGazetteer No. 14-3. Progress has been made in drafting and typing a textual summary for each approved name, including notes on the geographical-historical aspects of the feature. Approximately 9,500 texts are completed, and 1,500 remain to be done.

A-11727
Landrum, B.J.
ANTARCTIC INFORMATION SERVICES AT THE SMITHSONIAN OCEANOGRAPHIC SORTING CENTER. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.212-213, 4 refs.
G845.A56

The Smithsonian Oceanographic Sorting Center not only attempts to insure that systematists receive accurate and complete data with specimens shipped, but it acts, under the Antarctic Records Program, as a centralized national source of information on antarctic natural history collections at other locations. During participation in Eltanin Cruises 46 and 51 the Center utilized Eltanin's computer to facilitate data retrieval and dissemination and aided in the collection and preservation of reference collections, including whole samples and the residuals of samples obtained by other programs largely for various destructive analyses. Workable procedures were established on Cruise 51 for documentation of all over-the-side scientific activities. Forthcoming services and refinements are briefly summarized.

A-11728
Thuronyi, G.T.
BIBLIOGRAPHIC COVERAGE OF POLAR LITERATURE. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.213-214
G845.A56

The Cold Regions Bibliography Project prepared some 1,400 abstracts in the past year, bringing the total since 1963 to 10,900. Volume 5 of the Antarctic Bibliography, containing items 8,0001-10,000 with author, subject, geographic, and grantee indexes, was published in September and is available at $5.75 a copy from the Superintendent of Documents, U.S. Government Printing Office. A significant event of the year was the initiation of a project entitled Prototype Polar Bibliography System, which calls for development of an automated system capable of handling bibliographies dealing with polar literature. As an initial step, an input format was designed for entering citations and abstracts of the Antarctic Bibliography into a computer data bank, and mechanized input of the records has already begun. The new input system will constitute a single data base for the Antarctic Bibliography and the Bibliography on Cold Regions Science and Technology. The two bibliographies, however, will retain their separate identities at the output stage. The production of 3 by 5-in. cards, which have been serving for current awareness will be replaced by a computer-produced accessions list.

A-11730
Sousk, S.F.
ANTARCTIC RESEARCH SERIES. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.215
G845.A56

Five volumes of the Antarctic Research Series have been published since mid-1971. They include: Volume 15, Antarctic Oceanology I; Volume 16, Antarctic Snow and Ice Studies II; Volume 17, Biology of the Antarctic Seas IV; Volume 18, Antarctic Pinnipedia; and Volume 19, Antarctic Oceanology II: The Australian-New Zealand Sector. Additional volumes in press include ones on terrestrial biology, brachiopods, and human adaptability. Volumes 2 through 19 are available from the American Geophysical Union.

A-11732
UNITED STATES ANTARCTIC RESEARCH PROGRAM, 1972-1973. PLANNED FIELD RESEARCH PROJECTS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.218-224
G845.A56

The 1972-1973 United States Antarctic Research Program will include research at or near five U.S. antarctic stations, at three remote field locations, at Deception Island, and aboard icebreakers off the Oates Coast and in the Ross and Weddell Seas. The research ship Eltanin will work in the southern Indian Ocean, and the small research ship Hero will operate in the Antarctic Peninsula area in conjunction with

Palmer Station. Major efforts for this season will be (1) drilling of the Dry Valley Drilling Project's first hole--on Ross Island near McMurdo Station, (2) continuation of a topographic and geological survey of the Lassiter Coast, (3) continued support for the International Antarctic Glaciological Project, (4) establishment of a year-round facility at Siple Station, and (5) deep-sea drilling by Glomar Challenger off the Ross Ice Shelf. Year-round programs at Pole, McMurdo, and Siple Stations will continue to concentrate on atmospheric sciences, while work at Palmer Station will emphasize marine biology. The planned research projects are briefly described.

A-11736
Treshnikov, A.F.
PROMINENT POLAR TRAVELER. HUNDREDTH ANNIVERSARY OF THE BIRTH OF ROALD AMUNDSEN. Vydaiushchiisia poliarnyi puteshestvennik. K 100-letiiu so dnia rozhdeniia Rualia Amundsena. Akademiia nauk SSSR. Vestnik, July 1972 No.7, p.125-129, In Russian.

A brief review of Roald Amundsen's early life is followed by description in some detail of his exploration of the poles and disappearance in the 1928 plane crash.

A-11739
FRENCH NATIONAL COMMITTEE FOR ANTARCTIC RESEARCH. INFORMATION BULLETIN NO.47-48. Comité National Français des Recherches Antarctiques. Bulletin d'informations no.47-48. TAAF (Paris), April-Sept. 1971 No.55-56, p.64-93, In French.
G845.F7

Observations of the magnetic field and in meteorology at Terre Adelie, and Kerguelen, Crozet, and Amsterdam Islands are tabulated for the January-March 1971 period according to the standard TAAF format. The meteorological tables include climatology, aerology, and for the stations of other countries, mean monthly temperature data.

A-11740
DISTRICT NEWS (APRIL-SEPTEMBER, 1971). Nouvelles des districts (Avril-Septembre 1971. TAAF (Paris), April-Sept. 1971 No.55-56, p.109-123, In French.
G845.F7

Current news from the Kerguelen, Amsterdam, Crozet Islands, and Terre Adelie is given. Kerguelen progressed in construction, communications network development, salmonide research, and mammal and bird studies. At Amsterdam the meteorological balloon inflation device is virtually ready for service, and construction and installation of other structures and equipment is proceeding on schedule. Details are given of the new Crozet infirmary. Terre Adelie awaited the summer preparing for the 1972-1973 glaciological program on the Antarctic plateau.

A-11741
Great Britain. Natural Environment Research Council
BRITISH RESEARCH IN THE ANTARCTIC. Gt. Brit. Natural Environment Research Council. Publications Series B. No.1, 1971, 34p.
G870.G72

This two-part report on British Antarctic research covers, in Part I, the value of Antarctic research, the historical background of British Antarctic research, and the British Antarctic Survey today (finances, logistics, personnel, methods, etc.). Part II deals with current research. The survey and mapping program is emphasizing completion of the 1:200,000 sheet series on British Antarctic Territory. Radiosonde and ionospheric studies form the major part of the atmospheric physics research. Attempts are being made to determine the structure of the Scotia Ridge and of the contact zone between the continental shield and the Antarctandes by gravitational, seismic, and magnetic field surveys. Quaternary geological studies are being stressed, along with geological mapping. Glacial mass balance, ice physics, soundings to determine subglacial relief, and chemical analysis of snow are a few of the numerous projects in this field. Finally, attention is being given to ocean biology with a view to farming potential and human physiology (the effects of both cold and isolation).

A-11742
Deutsche Gesellschaft für Polarforschung
MEETING OF 1967. SUMMARIES OF PAPERS. Polartagung 1967. Zusammenfassungen der Vorträge. [Stuttgart, 1967], 33p., In German, English, Spanish, and French.
QE70.D46

Summaries of a wide range of papers on polar regions are given. Measurement of the atmospheric electric field at Koning Boudewijn Base found the yearly mean near the surface to be E=-141 V/m and potential difference between the ionosphere and earth V=250kV. A new, ten-part definition of "polar" region is given based on such criteria as ice type, precipitation, vegetation, latitude, accessibility, and economic status. The size-distribution of particulate fallout in the 0.6 to 3 micron range in Greenland and Antarctica was measured. Glaciological studies cover piezoelectricity in ice crystals; glacial erosion; Barnes ice cap mass budget, depth sounding, and bottom stress analysis. Arctic climatic investigations, a study of volcanoes, and an attempt to determine the route of cold water flowing from the Weddell and Ross Seas are also summarized.

A-11743
Gonzalez Porter, C.
ANTARCTIC ADVENTURE. Aventura en la Antártica. Puerto Rico, Departamento de Instrucción Pública, 1970, 143p., In Spanish.
G860.G57

Popular description of a journey the author undertook with a group consisting mostly of tourists on the 11,500-ton ship Yapeyu built in Holland. The group disembarked on Deception and Melchior islands and on the continent. The account of the voyage is interspersed with descriptions of the life on antarctic birds and animals and with narratives of exploration history. The volume is generously illustrated with drawings and photographs.

A-11753
National Research Council. Panel on Geology and Solid Earth Geophysics, Craddock, C. comp
EARTH SCIENCE INVESTIGATIONS, UNITED STATES ANTARCTIC RESEARCH PROGRAM (USARP) FOR THE PERIODS JULY 1, 1968-JUNE 30, 1969; JULY 1, 1969-JUNE 30, 1970; JULY 1, 1970-JUNE 30, 1971; AND JULY 1, 1971-JUNE 30, 1972. Washington, D.C., National Academy of Sciences-National Research Council, 1969, 1970, 1971, 1972, 4 Vols., Numerous refs.
QE350.N37

Four reports in a series of annual reports on work in the earth sciences carried out as a part of the U.S. Antarctic Research Program are presented, covering the period July 1, 1968 to June 30, 1972. Summaries of U.S. work, along with reports prepared by other nations, are compiled as a service to Antarctic geologists around the world to assist them in keeping informed about the activities and publications of their colleagues. The committee on Polar Research distributed questionnaires to all individuals who participated in the Antarctic earth science program during the past ten years, using a list provided by the National Science Foundation. Almost all currently active U.S. Antarctic geologists and solid earth geophysicists are included in this report, along with a number of other earth scientists.

A-11770
Scharon, H.I.
WITH THE SOVIETS IN ANTARCTICA. Washington University magazine, Winter 1970 40(2), p.22-27

After a 16-month stay with Soviet researchers in Antarctica, the author describes the ease with which Americans and Russians can cooperate and live together. Brief comments on construction of the Bellingshausen Station are included.

A-11782
Antarctic Treaty Consultative Meeting, 1966, 4th, Santiago, Chile
BASIC DOCUMENTS. Santiago, Chile, 1966, 38p.

Basic documents of the Antarctic Treaty meetings are reprinted, preceded by the text of the treaty itself. The full text of recommendations for the first three consultative meetings (Canberra, 1961; Buenos Aires, 1962; Brussels, 1964) are given, along with the rules of procedure and the agreed measures for the conservation of antarctic fauna and flora.

A-11863
Japan. Science Council. National Antarctic Committee
NATIONAL REPORT ON JAPANESE ANTARCTIC RESEARCH ACTIVITIES FOR 1971. COMPLETED PROGRAMMES: FEBRUARY 1970 - FEBRUARY 1971 AT SYOWA STATION; NOVEMBER 1970 - MAY 1971 ON BOARD THE FUJI. PROPOSED PROGRAMMES: NOVEMBER 1971 - OCTOBER 1972. Tokyo, June 1971, 32p., 58 refs.

The report outlines the scientific research completed at Showa Station from Feb. 1970 to Feb. 1971, on board the icebreaker Fuji in the 1970-71 summer, and at the Lake Vanda area in Victoria Land. Observations were carried out by the 11th Japanese Antarctic Expedition (JARE-11) and JARE 12 had taken over on Feb. 20, 1971. The report also provides a tentative program of proposed research from Nov. 1971 to Oct. 1972 at Showa Station, on board the Fuji, and in the dry valleys of Victoria Land.

A-11869
Friis, H.R. ed, Bale, S.G., Jr. ed
UNITED STATES POLAR EXPLORATION. Conference on United States Polar Exploration, 1967, Washington, D.C., [Proceedings] (National Archives Conference No.1), Athens, Ohio, Ohio University Press, 1967, 199p., Refs.
G678.C67 1967

The Conference on United States Polar Exploration, held on September 8, 1967, and attended by more than two hundred persons, formally opened the Center for Polar Archives in the National Archives. The Center is designed to serve as a depository both for private collections of polar papers and for records created by the Federal agencies involved in polar exploration and research. They will be preserved in a properly controlled archival environment and will be made available to scholars for research, subject in some cases to restrictions placed on them by the private donor or the Federal agency that created them. The purpose of this conference, in addition to opening the Center for Polar Archives, was to call to the attention of those involved in polar activities the availability of this specialized archival facility and to notify scholars that some Federal records and private papers are already available. Papers presented at the conference which are pertinent to antarctic regions have been abstracted separately as A-11870 through 11881.

A-11870
Friis, H.R.
CENTER FOR POLAR ARCHIVES. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.3-6
G678.C67 1967

The official records and private papers resulting from polar exploration and research have been preserved in a wide variety of depositories throughout the country. For example, a survey of the extant records of the United States Exploring Expedition commanded by Lt. Charles Wilkes, 1838-1942, reveals that they may be found in at least twenty-five different depositories. The Center for Polar Archives has been established by the Archivist of the United States to preserve such records. Among its objectives and functions are: the collection, preservation, and description of official records and personal papers; the compilation and publication of a list of all U.S. official and private expeditions and programs in the polar regions; the compilation of an inventory locating the official records and personal or private papers in all depositories; the compilation of a bibliography of the publications that resulted from the expeditions and programs before 1942; and reference service to qualified researchers on material in its custody.

A-11871
Dater, H.M.
UNITED STATES EXPLORATION AND RESEARCH IN ANTARCTICA THROUGH 1954. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.43-55, 22 refs.
G678.C67 1967

Highlights of the history of U.S. geographical exploration and scientific research in Antarctica are traced from visits by sealers who came in search of profit in 1820 to operations in support of IGY programs in 1954. Important to the beginnings of scientific exploration in Antarctica were the voyage carrying the first U.S. scientists to the continent in 1829 and 1830, including James Eights whose published observations still remain valid; the Wilkes Expedition of 1838-42; and the two Byrd expeditions in 1928-30 and 1933-35, which fixed Antarctica permanently in the American consciousness. The U.S. Antarctic Service, (USAS) created in 1939, sponsored a successful major expedition in 1939-41 during which two bases were occupied: Little America III and Stonington I. The Antarctic Developments Project's Operation Highjump in 1946-47 remains

the largest expedition ever sent to the Antarctic. Operation Windmill in 1947-48 and Finn Ronne's privately conducted expedition were the last significant contributions to Antarctic exploration until the IGY programs of 1954.

A-11872
Crary, A.P.
UNITED STATES EXPLORATION AND RESEARCH IN ANTARCTICA FROM 1955. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.56-61
G678.C67 1967

The highlights of U.S. exploration in the Antarctic since 1955 have been closely linked with aircraft. The eight major achievements during this period are: 1) the voyage of the U.S.S. Atka, AGB-3, an American built icebreaker that prepared for U.S. participation in the IGY by surveying the ice front and possible station sites along the Atlantic and Pacific Coasts of Antarctica; 2) the Dec. 20, 1955 flight of the first aircraft in history to land in Antarctica from outside land areas; 3) the exploratory flights of 1955-56; 4) the landing of the Skytrain Que Sera Sera at the geographic South Pole on Oct. 31, 1956; 5) the blazing of a trail between Byrd and Little America V stations with giant 20-ton tractors during the austral summers of 1955-56 and 1956-57; 6) an extensive oversnow traverse program which started in 1957, to be completed in 1969; 7) the first winter occupation of the Amundsen-Scott Station during 1957; and 8) the Antarctic Treaty.

A-11873
Southard, R.B., Jr.
UNITED STATES GEOLOGICAL SURVEY ANTARCTIC MAPPING OPERATIONS. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.62-68
G678.C67 1967

It is the responsibility of the Geological Survey to produce maps at whatever scales are required to support USARP activities. Systematic photogrammetric mapping requires procurement of aerial photography, establishment of ground control, and compilation of the map. The first objective of the USARP mapping program is to produce 1:250,000-scale maps with 200-m contours of all the mountainous and coastal areas of West Antarctica. The tricamera system of mapping photography is used. Mapping control operations have improved significantly with the introduction of Army gas-turbine helicopters for the exclusive use of Survey topographic mapping parties. A recent addition to the mapping program is the interim 1:500-000-scale, shaded-relief sketch map series. The Geological Survey maps of Antarctica conform to the recommendations of the Working Group on Geodesy and Cartography of SCAR, and the Survey is the focal point within the U.S. for the international exchange of this data in its function as the U.S. Antarctic Mapping Center.

A-11874
Sladen, W.J.L.
LOGISTIC AND TECHNOLOGICAL CONTRIBUTION OF THE UNITED STATES TO ANTARCTIC BIOLOGICAL RESEARCH. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.69-76, 12 refs.
G678.C67 1967

U.S. logistic support has proved an invaluable aid to antarctic biological research in botany, biochemistry, mammalogy, ornithology, microbiology, invertebrate ecology, marine biology, and physiology. A journey on foot from Hut Point to the Emperor penguin rookery at Cape Crozier in 1911, which took 18 days as described in the diary of Apsley Cherry-Garrard, can presently be accomplished in 30 min by Navy helicopter. It was necessary in the late 1940's to spend the winter in Antarctica in order to study the breeding biology of the Adelie penguin, but U.S. air support now makes it possible to be at the rookeries when the penguins arrive. The winter flights from Christchurch to McMurdo Station also offer good opportunities for austral winter research by scientists and students. Improved technological developments in Antarctica include the biological lab. at McMurdo Sound, marine biology techniques, biotelemetry, and SCUBA diving. The continued success of the Antarctic Treaty insures international cooperation and international conservation.

A-11875
Siple, P.A. , Wade, F.A.
WEST BASE OPERATIONS, UNITED STATES ANTARCTIC SERVICE, 1939-41. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.79-88, 6 refs.
G678.C67 1967

The accomplishments of the U.S. Antarctic Service (USAS) Expedition at West Base (Little America III) and aboard ship are summarized. Exploratory flights from the U.S.S. Bear during two cruises eastward from Little America III in late Jan. and Feb. 1940 resulted in the mapping of all but one of the northern coasts of the northernmost islands in the hitherto unknown section of the West Antarctica archipelago. Geographical exploration was conducted from Little America III during 1940 and 1941 by means of two aircraft and five field parties. In supplemental flights, the major portion of the Ross Ice Shelf was mapped and 400 mi of the face of the ice shelf were photographed. The scientific program at Little America III included detailed observations and research in the fields of auroral phenomena, bacteriology, botany, cosmic rays, glaciology, magnetism, medicine, meteorology, ornithology, paleontology, petrology, physiology, seismology, stratigraphy, structural geology, and zoology.

A-11876
Black, R.B.
EAST BASE OPERATIONS, UNITED STATES ANTARCTIC SERVICE, 1939-41. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.89-99
G678.C67 1967

The exploratory work by members of the U.S. Antarctic Service (USAS) Expedition at East Base was hampered by extremely unfavorable flying conditions caused by low clouds. Including the test flights and the 16 exploratory and cache-laying flights made, a total of only 94 flying hr was logged. At the conclusion of flight operations, however, members of East Base had discovered and mapped 1,600 mi of previously unknown coastline and had observed roughly 250,000 sq mi of new land and sea areas. In addition, by sledge and flight, the insularity of Alexander I Land (Alexander I.) and the peninsularity of the Antarctic Peninsula had been proven. Two major trail journeys were made by the Southern Party under Finn Ronne and the

Weddell Coast Party under Paul H. Knowles. The Southern Party made a remarkable march of about 1,100 nautical mi in 84 days. They found that George VI Sound wings westward to join the Bellingshausen Sea, thereby proving the insularity of Alexander I Land. The scientific studies conducted at the base and its emergency air evacuation because of winter ice in Marguerite Bay are described.

A-11877
Bertrand, K.J.
WRITING AND RESEARCH ON UNITED STATES EXPLORATION IN ANTARCTICA. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.100-119, Numerous refs.
G678.C67 1967

U.S. interests in the Antarctic have been of two types: commercial (sealing) and scientific (exploration and research). Information about the exploration and discoveries of the sealers is scanty, while a great mass of widely scattered material exists on scientific exploring expeditions. The first U.S. scientific exploring expedition to the Antarctic was the Wilkes Expedition, officially the U.S. Antarctic Exploring Expedition, during parts of 1839 and 1840. The most extensive scientific exploration by Americans has taken place in the twentieth century, especially since 1928. Three kinds of source materials which provide information on U.S. antarctic exploration are discussed: 1) books and periodicals, 2) newspaper reports, and 3) unpublished manuscript materials, such as logbooks, journals, diaries, maps, sketches, and correspondence. Photographs of various kinds are part of the records of the twentieth century expeditions.

A-11878
Mooney, J.E.
COMMENTS ON LEGISLATION FOR A RICHARD E. BYRD ANTARCTIC COMMISSION. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.120-123
G678.C67 1967

A number of bills have been introduced in the House of Representatives since the Eighty-sixth Congress, proposing the establishment within the Government's executive branch of an administrative unit for antarctic programs, to be known as the Richard E. Byrd Antarctic Commission. Among its functions, the commission would maintain a depository of information relating to Antarctica; conduct field and laboratory studies for the advancement of knowledge of Antarctica in science, commerce, and related activities; publish or provide for the publication of scientific, technical, historical and general information about Antarctica; approve the plans for and supervise antarctic activities conducted or supported by Federal agencies except those of a military nature; and make arrangements for the conduct of scientific research and other scholarly activities in Antarctica by private or public institutions or persons that would implement the purposes of the commission. To administer the commission, there would be a director, two deputy directors, and a board of governors. None of the bills has reached the House floor since referral to the House Committee on Interior and Insular Affairs.

A-11879
Wade, F.A.
RESPONSIBILITIES OF THE POLAR SCIENTIST-EXPLORER. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.146-153
G678.C67 1967

Exploration and scientific research in the polar regions are financed with funds from two principal sources: Government grants or appropriations and private and institutional donations. Exploration in these regions is very costly. It is therefore of primary importance that the scientist-explorer make available the results of his endeavors through publications, even though it may be difficult at times to fulfill these obligations. In many instances the sponsors of an expedition have neglected to provide for the post-expedition work which ultimately results in the desired publications, and the scientists have had to assume full financial responsibility for completing their tasks. Developments in opportunities for and the methods of polar exploration and research during the last decade are discussed. It is urged that scientist-explorers place their data, manuscripts, and specimens in designated depositories for perusal and study by any and all interested parties.

A-11881
Washburn, A.L.
POLAR RESEARCH: SOME ISSUES. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.178-187, 2 refs.
G678.C67 1967

The following aspects of polar research are discussed: the maintenance of high quality in research and in training graduate students; the desirability of a proper balance between public and private support of polar research; the high cost and resulting problems for the private sector; the administration of science as it bears on the philosophy of an area of study for its own sake as opposed to the significance of areal variations for a discipline; the importance of interdisciplinary programs and of a proper balance between field and laboratory work; and the desirability of international cooperation in arctic as well as antarctic research.

A-11885
BUDGET CUTS SCUPPER NSF'S ELTANIN. Science, Feb. 16, 1973 179(4074), p.665
Q1.S35

The 11-yr career of the National Science Foundation's research ship Eltanin was terminated on Dec. 25, 1972 as part of the President's goal to hold down federal spending in the current fiscal year. The NSF acquired the ship in 1961 and converted it to a floating laboratory that soon began the first of 55 research cruises around the southern oceans, most of them running for 2 months at a time. In the intervening years, the ship systematically criss-crossed the southern Atlantic, Pacific, and Indian oceans in a 280 deg band around Antarctica--amassing geophysical, chemical, atmospheric, and biological data and samples from 2000 separate stations. The vessel was within 2 years of rounding out this most thorough of all circumpolar surveys when the Eltanin's last appropriation was impounded.

A-11900
Neider, C.

WALK IN TAYICR VALLEY. Antarctic journal of the United States, Nov.-Dec. 1972 7(6). p.249-253

The most famous and one of the largest of the dry valleys is Taylor Valley, first explored by Scott during the Discovery Expedition, and named for Griffith Taylor, the geologist on Scott's last expedition. Taylor explored the valley in Jan. 1911 and described it as 4 mi wide, 3000 ft deep, and 25 mi long without a patch of snow. The author paid a visit to Taylor Valley in Jan. 1971, spending a day on the excursion. He describes the sights during the 175 mi flight to Bonney Hut on the shore of Lake Bonney (made in a roundabout way for purposes of sightseeing) and during a hike in the valley.

A-11904
U.S. ANTARCTIC RESEARCH PROGRAM: PLANNED YEAR-ROUND RESEARCH PROJECTS, 1973. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.262-263

Year-round research in the United States Antarctic Research Program will take place at McMurdo, Pole, Siple, and Palmer Stations. Also, a U.S. exchange scientist will winter at the Soviet coastal station Molodezhnaya. The projects are briefly described, and the names of the principal investigators and their institutions are given.

A-11907
Diubkin, I.A. , Bychkov, N.F., Kolesnikov, A.P.
AUTOMATED COLLECTION OF ACTINOMETRIC DATA IN THE ANTARCTIC. Avtomatizatsii sbora aktinometricheskoi informatsii v usloviiakh Antarktiki. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1970 Vol.291, p.120-124

The procedures for computerized collection of actinometric data from Antarctica are discussed. Continuous recording of the components of the radiation balance is performed with the EPP-09 electronic potentiometer, an instrument which also records wind speed, global, direct, and reflected radiation; the potentiometer serves as the technical base for the first stage of automation. Data is assembled on telegraph tape and transmitted to the computer. A block diagram of the complete data collecting system and details on computer procedures are included.

A-11917
CHILEAN ANTARCTIC RESEARCH. La investigacion cientifica de Chile en la Antartica. Santiago de Chile. Instituto Antartico Chileno. Boletin, 1972 No.7, p.3-6, In Spanish.

Chilean antarctic research is briefly reviewed in three parts: earth sciences, biology, and atmospheric sciences. Major areas of research within earth sciences include volcanology on Deception Island, setting up of a seismological station at O'Higgins, and an oceanographic program combining the efforts of INACH and the Chilean navy. Wide-ranging biological research includes several new programs in 1972: study of antarctic lakes, bird migration, hepatic enzymes in fish, and economic exploitation of krill. Atmospheric investigations are of the usual type, mostly meteorological with some ionospheric studies. Names and locations of 15 Chilean institutions involved in antarctic research are given.

A-11922
Ulriksen U., P.
ANTARCTIC ACTIVITIES OF INACH DURING THE 1971-1972 SUMMER. Actividades desarrollades por el INACH en la Temporada Antartica de Verano 1971-1972. Santiago de Chile. Instituto Antartico Chileno. Boletin, 1972 No.7, p.19-22, In Spanish.

Chilean research in the Antarctic conducted by INACH during the 1971-1972 summer is reviewed. A 5 KW transmitter was installed at King George Island for meteorological purposes. Benthic specimens were collected on three islands. Volcanic studies in the northwestern part of the Weddell Sea established the presence of a volcanic line of recent age parallel to the east coast of the Antarctic Peninsula (characterized by an island chain). Other work included study of the food chain of fish, physical and chemical oceanography, census of birds and mammals, and specimen collection for Chilean museums.

A-11927
SUMMARY OF SCIENTIFIC ACTIVITIES DURING THE 25TH ANTARCTIC PROGRAM (1970-1971). Resumen de las actividades cientificas desarrolladas durante la XXV Comision Antartica (1970-1971. Santiago de Chile. Instituto Antartico Chileno. Boletin, 1971 No.6, p.13-15, In Spanish.

A brief summary of INACH's activities during 1970 and 1971 is given. Personnel, work areas, dates, logistic help, and results are indicated and projects in biology, geology, glaciology, oceanography, seismology, and volcanology.

A-11928
Dezerega C., V.
PLANNING ANTARCTIC ACTIVITIES FOR 1972-1976. Planificación de las actividades antárticas 1972-1976. Santiago de Chile. Instituto Antártico Chileno. Boletín, 1971 No.6, p.16-17, In Spanish.

INACH's Antarctic research plans for 1972-1976 are intended to centralize research efforts and coordinate them with national goals. The economic interest of Chile in Antarctica is emphasized.

A-11929
Hermosilla R., W.
CHILE'S PRESENCE IN ANTARCTICA. Presencia de Chile en la Antártica. Santiago de Chile. Instituto Antártico Chileno. Boletín, 1971 No.6, p.18-19, In Spanish.

The physical proximity of Chile to Antarctica (670 km), direct effect of Antarctica on Chile's weather, and wealth of the Antarctic seas are among the factors in Chile's close relationship with the continent. It may also be assumed that mineral riches of Antarctica resemble those of the Andes, promising great potential economic benefit of the continent to Chile. The place of INACH within the international research effort of Antarctica is summarized.

A-11939
U.S. Office of Geography
ANTARCTICA; OFFICIAL NAME DECISIONS OF THE UNITED STATES BOARD ON GEOGRAPHIC NAMES. 3rd edition, U.S. Board on Geographic Names. Gazetteer No.14-3, Washington, D.C., U.S. Geographic Names Division, June 1969, 217p.

The third edition of the gazetteer contains 10,000 name decisions of the Board on Geographic Names, concurred in by the Secretary of the

Interior, for features in Antarctica and the area northward to the Antarctic Convergence. It is the most comprehensive listing of Antarctic names to date. Except for a few whaling stations, all entries are for mountains, peaks, glaciers, peninsulas, capes, bays, islands, or other physical features. The names are listed alphabetically, with designations and geographic coordinates.

A-11940
Kotlerts, I.F.
TIME RECKONING IN THE RUSSIAN FLEET AND CHRONOLOGY OF EVENTS DURING THE FIRST RUSSIAN ANTARCTIC EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.47-58. Translated from its Informatsionnyi biulleten', No.80, 1970. 20 refs.

The time-reckoning method and chronology of events described in F.F. Bellingshausen's book Two Explorations in the Southern Ocean are discussed. The three time-reckoning methods current in nautical practice since founding of the Russian navy--astronomical, nautical, and civil--are described and related to the text. Bellingshausen's work is found to be accurate and his system of giving the dates in civil time in the margins is defended.

A-11959
Korotkevich, E.S.
ELEVENTH MEETING OF THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (SCAR). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.103-105, Translated from its Informatsionnyi biulleten', No.80, 1970.

The Eleventh SCAR Meeting on August 17-22, 1970, in Oslo, rejected a proposal to include the Arctic within its sphere of concern. Uruguay's request to join was rejected because it does no active research in Antarctica. The main office will remain permanently at the Scott Polar Institute in Cambridge, England. The Ross Ice Shelf drilling project was approved, and a program of 17 deep seismic profiles was adopted by the working group on geology. Other points covered by the agenda are noted briefly.

A-11961
Gertovich, V.I.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.107-113. Translated from its Informatsionnyi biulleten', No.80, 1970.

Soviet research in the Antarctic from May to October 1970 is reviewed. The development of cyclones and other meteorological events is described and a table of values of meteorological elements at the ground is given. The state of the geomagnetic field is briefly described for each month according to data collected at Mirnyy, Vostok, Molodezhnaya, and Novolazarevskaya. Hydrological and glaciological-geographic ice observations for Mirnyy, Molodezhnaya, and Bellingshausen are discussed. Continuation of the Vostok Station drilling project, with limited data on core recovery and snow chemistry is described. Observations of breeding in an Emperor penguin colony are reported.

A-11972
NEW NAMES DECIDED BY THE ANTARCTIC PLACE-NAMES COMMITTEE OF JAPAN. Antarctic record, Nov. 1972 No.45, p.112-120. In Japanese with English summary.

On Dec. 1, 1971 the Antarctic Place-names Committee of Japan was organized as an advisory committee to the Director of the Polar Research Center, National Science Museum. The Committee worked out 47 new place names, which were officially approved by the Japanese Antarctic Research Expedition Headquarters. An alphabetical list records the newly adopted 47 names, in addition to previously adopted 98 names.

A-11998
Bentley, C.R. , Budd, W.F., Kotliakov, V.M., Lorius, C., Robin, G. de Q.
INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT STANDARDIZATION DOCUMENT. Polar record, May 1972 16(101), p.349-364
G575.P6

The aim of the International Antarctic Glaciological Project (IAGP) is to determine the glaciological regime and processes of a sizeable part of the Antarctic ice sheet. The project is being carried out primarily by Australia, France, USA, and USSR with assistance from other countries in certain aspects of the program. At the meeting of the IAGP Council in Moscow, July-Aug. 1971, common standards were agreed upon for various studies so that different national groups could produce results that may be readily compared. The standards are set out in this document, including the types and accuracy of measurements that are desirable, parameters to be measured, location or spacing of measurements, and methods and types of instruments to be used.

A-12014
Maksutov, D.D.
SCIENTIFIC OBSERVATIONS BY THE FOURTEENTH SOVIET ANTARCTIC EXPEDITION (INVESTIGATIONS IN WINTER). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.119-125. Translated from its Informatsionnyi biulleten', No.81, 1970.

Scientific observations made during winter by the Fourteenth Soviet Antarctic Expedition are summarized. Type of program, frequency of observation, and site of observations are tabulated. Comments are included on logistical support and foreign cooperation.

A-12023
Kudriavtsev, N.F.
WORK AT BELLINGSHAUSEN STATION IN 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.150-151. Translated from its Informatsionnyi biulleten', No.81, 1970.

Activities at Bellingshausen Station in 1969 (Fourteenth Soviet Antarctic Expedition) expanded previous meteorological programs, emphasizing upper-air observations with radiosondes and studies of radio wave propagation and variations of geomagnetic field components. New radio transmission equipment was installed. The climate posed major difficulties for research - glaze, blowing snow, formation of fast ice (causing great logistic problems).

A-12024
Artem'ev, A.N.
WORK AT VOSTOK STATION IN 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.151-152.

Translated from its Informatsionnyi biulleten', No.81, 1970.

Research programs at Vostok Station carried out by the Fourteenth Soviet Antarctic Expedition in 1969 were wide-ranging. Geomagnetism, cosmic ray recording, auroral observations, and vertical ionospheric soundings were included in the geophysical program. VLF signals were recorded at 11 kHz, earth tides were investigated with an undersnow instrument shelter, and an experimental self-contained, long-recording magnetic variation station was set up with an isotopic power supply. Aerological soundings, glaciological studies, and medical investigations were also conducted. Details are given on the Soviet-American program of geophysical observations (emphasizing riometer observations, VLF study, recording of earth currents, and study of micropulsations of the H, D, and Z components of the geomagnetic field)

A-12040
South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research
FOURTEENTH REPORT TO SCAR ON SOUTH AFRICAN ANTARCTIC RESEARCH ACTIVITIES DURING THE TWELVE MONTHS ENDED DECEMBER 1971, WITH A SUMMARY OF ACTIVITIES DURING 1972 AND PLANNED FOR 1973. C.S.I.R. Special report INFO 46, Pretoria, Sept. 1972, 23p.

Programs carried out during 1971 at SANAE Station, Grunehogna, and Marion and Gough Is. are described. Listings show the station location, equipment and instruments used, type and schedule of observations, observation and computation procedure and type of data obtained. Publications resulting from the research are listed.

A-12041
INTERNATIONAL DECADE OF OCEAN EXPLORATION. U.S. National Science Foundation. Annual report, 1973(FY 1972) 22nd, p.39-41, NSF 73-1
Q11.U82

The Office for the International Decade of Ocean Exploration (IDOE) entered its second year with programs continuing in environmental quality, environmental forecasting, and seabed assessment, and a fourth-program -- living resources -- was added. Preparations were completed for the Geochemical Ocean Sections Study (GEOSECS), a program of measuring oceanic constituents at all depths along sections from the Arctic to the Antarctic in the Atlantic and Pacific Oceans. The first major cruise began in July 1972. Trace constituent and radioisotopic data are being used to establish geochemical baselines and for quantitative studies of oceanic mixing and descriptive models of ocean circulation.

A-12042
POLAR PROGRAMS. U.S. National Science Foundation. Annual report, 1973(FY 1972) 22nd, p.41-42, NSF 73-1
Q11.U82

Beginning with fiscal year 1972, the Foundation assumed responsibility for funding the entire U.S. program in Antarctica except for icebreaker support. Research continued year-round at four stations. In the austral summer, 142 investigators carried out 51 research projects at U.S. stations and in the field. Other investigators were aboard the research ships Eltanin and Hero and on two icebreakers. Logistic support was furnished by the U.S. Navy and the Coast Guard . Byrd Station was closed in Jan. 1972 and Siple Station will become a year-round station next year. Preliminary results of a seal census indicate that nearly a million seals inhabit the pack ice of the Bellingshausen and Amundsen Seas. Preliminary investigations are being made for several drilling projects.

A-12045
Neethling, D.C.
SOUTH AFRICAN ANTARCTIC EARTH SCIENCE PROGRAMME 1959-1969: SOLID EARTH GEOPHYSICS, OCEANOGRAPHY AND GLACIOLOGY. South African journal of antarctic research, 1972 No.2, p.2-5, 42 refs.

The results of South Africa's continuing program of exploration in the fields of geology, glaciology, solid earth geophysics, and oceanography, and of a station observatory program in seismology are reported. The area investigated constitutes part of the Queen Maud Land region of East Antarctica and includes the King Haakon VII Sea, the Fimbul Ice Shelf, the ice-covered mountains of the Ahlmannryggen and Borgmassivet inland from the Princess Martha Coast, and the Kirwanveggen, an escarpment along the edge of the Polar Plateau. Research activities have been staged from the Norwegian IGY base, Norway Station, SANAE Station, and Borga Base. The submarine and subglacial morphology of the Princess Martha Coast and the glaciology of the western part of the Fimbul Ice Shelf are discussed.

A-12066
Splettstoesser, J.F.
POLAR STUDIES. Geotimes, Jan. 1973 18(1), p.29-30

Major research programs in the polar regions in 1972 included the International Antarctic Glaciological Project (IAGP) which made an overland traverse from Dumont d'Urville Station, covering 1,600 km in 100 days, the Ross Ice Shelf Project (RISP), which is still in the planning stage, and the Dry Valley Drilling Project (DVDP), which is making reconnaissance studies in preparation for the first hole to be drilled on Ross I. in the 1972-73 season. In other USARP programs in 1972 the Eltanin carried out marine geophysics studies in the Ross Sea, southern Indian Ocean, Tasman Sea, and west Indian Ocean; the Hero continued support of glaciological programs in the area of Cape Horn and the Antarctic Peninsula; a geologic map of Antarctica at a scale of 1:5 million was issued by the American Geographical Society; the Second Conference on the Quaternary of the Antarctic was held in Canberra; and Antarctic Geology and Geophysics, the proceedings of a symposium held in 1970 in Oslo, was published. Arctic programs are also discussed.

A-12104
UNITED KINGDOM ANTARCTIC RESEARCH -- 1972 REPORT. APRIL 1971-MARCH 1972: RECORD OF ACTIVITIES. WINTER 1972: CURRENT ACTIVITIES. OCTOBER 1972-SEPTEMBER 1973: PLANNED ACTIVITIES. Royal Society of London. British National Committee on Antarctic Research. Report to SCAR, Dec. 1972 No.14, 42p., 68 refs.

This report outlines the scientific research completed in the Antarctic from April 1971 until the departure of the last relief ship in the 1971-72 summer. The greater part is concerned with the work of the British Antarctic Survey, a component body of the Natural Environment Research Council. A tentative outline program of proposed research for 1973 is also included. Stations occupied during 1971 were Stonington I.,

Argentine Is., Signy I., Fossil Bluff, South Georgia, Adelaide I., and Halley Bay.

A-12105
Miller, A.C., Jr. , Gonzalez, A.F., Jr., Granholm, N.H.
PORTRAIT OF ANTARCTICA: AN ANTIPODAL TRIALOGUE. Oceans, Jan.-Feb. 1973 6(1), p.22-33

This article serves as an introduction to a series of contributions from several authors whose common bond was participation in Antarctica's international effort through research, teaching, or building public awareness through the media. Parts of articles have been arranged in a contrived sequence to present the authors as though they were panelists taking verbal cues from each other. The discussion includes Antarctic geography, ice and snow, climate, fossil discoveries and the probability of continental drift, the Southern Ocean, and marine life, including microscopic diatoms, seabirds, seals and whales.

A-12107
Miller, A.C., Jr.
JOURNEY TO ANTARCTICA. Oceans, Jan.-Feb. 1973 6(1), p.38-41

This paper discusses the history of antarctic discovery and exploration, the impact of the IGY and the Antarctic Treaty on antarctic research, the economic potential of the continent and its value as a scientific laboratory. The knowledge gained from antarctic research may prove invaluable in weather forecasting, cleaning up the environment, understanding global ecology, and disclosing untold mineral resources. Other economic potentials include hydroponic farming, the development of exotic antibiotics found in the phytoplankton of the Antarctic Ocean, the possible use of plankton as food for humans, and the possibility of establishing in the far distant future intercontinental air routes and facilities across certain parts of Antarctica which would greatly reduce flying time for the southernmost countries. The Antarctic is one of the world's great international scientific laboratories and lends itself well to studies of atmospheric phenomena, meteorology, glaciology, seismology, and geomagnetic problems.

A-12108
Gonzalez, A.F., Jr.
BIGGEST, COLDEST OCEAN LABORATORY IN THE WORLD. Oceans, Jan.-Feb. 1973 6(1), p.42-45

An account is given of some of the research projects that were in progress in Antarctica during the author's visit there in 1969. Ocean research included a study to assess the protein potential of Antarctic seas by trawling for bottom fishes and for krill; fishing surveys to determine the size of the bottom and mid-water resources of the ocean waters around the Antarctic Peninsula; determination of the radiocarbon concentration of Antarctic waters for nuclear weapons tests; a study of Antarctic bottom water using 4 current-meter arrays anchored to the bottom; an attempt to measure tides in the deep oceans surrounding Antarctica using 3 deep-sea tide gauges 600 mi apart; protozoan studies; and investigations of tidal and meltwater pools and the waters of the Antarctic shoreline. Other research pertained to automated robot research stations; a remote control-device that could be soft-landed on Mars to detect biological life; studies of pole-adapted algae; and measurement of sleep patterns to predict behavior in stressful environments. International cooperation in the Antarctic, the high cost of antarctic research, and the hazards involved are commented on.

A-12130
1971-1972 SURVEY OF THE FRENCH SOUTHERN AND ANTARCTIC TERRITORIES: PROGRAM OF ACTIVITIES. Relève 1971-1972 dans les Terres Australes et Antarctiques Françaises: Programmes d'activités. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Oct.-Dec. 1971 No.57, p.81-106, In French.

Logistics, construction projects, research programs, and personnel involved are summarized for the French Antarctic program during 1971-1972. Information is included on the schedule of the Thala Dan; list of personnel; construction of a central radio building and balloon-sonde launch site at Dumont'd'Urville, new electric station at Crozet, living quarters and meteorological station at Kerguelen; and administrative decisions concerning the territories. Planned atmospheric programs include study of pollution and radioactivity. Other programs in the physical sciences will cover renovation of the Kerguelen seismological station, the setting up of additional stations to study geophysical and space phenomena, and an international expedition to study inland glaciers. Biological programs will cover all major life forms, including man and animals artificially introduced to the area.

A-12146
Llano, G.A. , Heer, R.R., Jr., Quam, L.O., Turner, M.D.
ANTARCTIC RESEARCH PROGRAM. McGraw-Hill yearbook of science and technology, 1970 Vol.9, p.1-11
Q121.M312

The United States scientific effort in Antarctica is carried out by about 200 scientists and technicians from some 40 universities, 10 research institutions, 7 government agencies, and 5 industrial laboratories. The funding and management of the USARP are provided by the National Science Foundation; logistic support is furnished principally by the U.S. Naval Support Force, Antarctica. In supervising this program, the NSF consults with other Federal agencies and receives advice from the Committee on Polar Research of the National Academy of Sciences, which serves as the voice of the scientific community. In 1969 research programs were operated in Antarctica by 11 nations, including the United States. There is much cooperation among the groups, and each year exchanges of scientists are arranged. Research conducted in the atmospheric, biological, and earth sciences is described.

A-12150
OTHER NATIONS WORKING WITH N.Z. RESEARCH PROGRAMME. Antarctic, Dec. 1972 6(8), p.262-263

Cooperation with scientists of other nations has been a feature of the New Zealand Antarctic research program this season. Russian and Japanese scientists are working in the dry valley area of the Ross Dependency with New Zealand assistance. New Zealand is taking part in a French experiment to determine the drift of icebergs in the Southern Ocean, and Italian scientists have been studying the New Zealand program in anticipation of participation in the 1973-74 program. New Zealand is also involved in drilling projects on Ross I. and in Antarctic waters. Two New Zealand research projects have been cancelled: the loss of the University of

Canterbury marine biology unit's trimaran has stopped this season's research, and a project in the Bowers Mts. of Northern Victoria Land was cancelled because of damage to one of the U.S. Navy's three Hercules aircraft. New Zealanders at Scott Base were hosts to 14 delegates to the seventh consultative meeting of the Antarctic Treaty nations in Wellington.

A-12157
Barker, J.R.M.
SCOTT BASE LEADER'S YEAR OF MEMORIES AND PROBLEMS. Antarctic, Dec. 1972 6(8), p.274-275

The author gives an account of life and work at Scott Base during the 1971-72 season when he served as the station leader. The beginning of the busy summer was marked by arrivals, briefings, departures, endless radio contacts, flight coordination meetings, crises, and problems solved. During Christmas the base staff was joined by field parties for the period of relaxation during which field trips were arranged for the summer base staff. At the end of the summer season preparations began for the winter season, including killing and storing seals for the dogs, moving the dog lines nearer the base, storing equipment and vehicles, and flagging fuel and routes. Before winter set in several sledge trips were undertaken to locations on the ice to obtain photographs and material for winter discussions. During the winter the amount of administration and coordination required became minimal. The last month was a time of increased activity -- visiting landmarks, completing the season's work at the base, and preparing for the arrival of the new team. Having reached the end of the season, the author recalls some of the events which filled the year with pleasant memories.

A-12160
NEW HALLEY BAY BASE MAIN TASK IN 1972-73. Antarctic, Dec. 1972 6(8), p.280-283

A major project in the British Antarctic Survey program for the 1972-73 season will be the construction of a new base at Halley Bay. The base, first established in 1956, was completely rebuilt in 1967; in the last two years there has been severe crushing by ice, and the buildings are now under 30 ft of snow. The size of the new base has been reduced to accommodate a maximum of 18 men--a team sufficient to keep Halley Bay operational as a full geophysical observatory. Field work will be reduced to a small amount of glaciology as work on the accessible rock areas has been completed. Activities during the season included transportation of men and supplies to the various B.A.S. bases by R.R.S. John Briscoe and R.R.S. Bransfield, glaciological field work in the area of Fossil Bluff and at South Georgia, gravity and magnetic surveys in the George VI Sound area, reindeer field work on the Barff Peninsula, geophysics studies at King Edward Point, preparations for summer biological work on Bird I., and a magnetic survey and VLF recordings at Halley Bay. A Stonington I. geologist, who became ill suddenly, was flown to Buenos Aires for emergency care with the help of the Instituto Antarctico Argentino and the Argentine Air Force.

A-12187
McElroy, K.
SUMMER IN ANTARCTICA. Washington University magazine, Summer 1967, p.42-45

A graduate student's (Thomas Q. Early) geological sampling project in Antarctica during the summer is briefly described with emphasis on living conditions and other human aspects.

A-12194
Loewe, F.
ALFRED WEGENER AND MODERN POLAR RESEARCH. Alfred Wegener und die moderne Polarforschung. Polarforschung, 1972 42(1), p.1-10, In German with English summary.

The state of scientific polar exploration at the time of Alfred Wegener's activities and his contributions to the development of polar transportation are described. Recent activity in Greenland and Antarctica based on Wegener's pioneer work in polar exploration and research are discussed.

A-12236
FIELD ACTIVITIES IN OCTOBER AND NOVEMBER 1972. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.20-26

Early season U.S. activities on the antarctic continent are summarized. Research in the McMurdo Sound area included fish and echinoderm physiology, freshwater and terrestrial ecosystems in the dry valleys, anatomy and population dynamics of seals, and a geological reconnaissance. Adelie penguins were studied and photographed at Hallett Staton. Programs at South Pole station included determination of the patterns of immunity to infectious diseases in isolated groups, atomospheric research, and satellite measurements of the Doppler effect. Magnetometer and synoptic VLF recordings began at the newly reopened Siple Station. The French traverse team, flown to Carrefour from McMurdo on Nov. 2, found travel difficult and were several days behind schedule by late Nov. In support activities U.S. aircraft were joined by RNZAF and RAF aircraft in hauling passengers, mail, and priority cargo from New Zealand to McMurdo Station, and in flying USARP passengers and cargo between Christchurch and McMurdo. Highest priority in the list of construction projects is the completion of Siple Station. Continuation of new station construction at the South Pole was 23 percent complete. Foremost among the McMurdo projects is replacement of the destroyed steel pier facing at Elliott Quay. At Palmer Station studies continued on foraminifera and the population dynamics of arthropods.

A-12237
SEVENTH ANTARCTIC TREATY CONSULTATIVE MEETING, 1972. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.26-27

Issues considered at the meeting held in Wellington, N.Z. from Oct. 30 through Nov. 10, 1972 included the conservation of antarctic fauna and flora, the preservation of the antarctic environment, and the problems associated with mineral exploration and the possible consequence of the commercial exploitation of antarctic resources. In addition, the Representatives took action on four reports received from SCAR in response to requests for information or guidance, discussed the Antarctic Treaty requirements for exchange of information, and expressed considerable interest in the commercial international air transportation system concept introduced by the U.S. delegation. On completion of the meetings the New Zealand government hosted a trip to the Antarctic for selected representatives from the Consultative Parties. The group was quartered at New Zealand's Scott Base during their 5-day stay during which visits were made to other areas with emphasis being placed on the problems of waste disposal and

ecological and conservation problems.

A-12244
Demidov, M.
SEVENTEENTH ANTARCTIC EXPEDITION. Semnadtsataia antarkticheskaia. Morskoi flot, 1973 No.2, p.36-38, In Russian.

Scientists from the US, Rumania and India were interviewed by the author during their trip to Antarctica on board the Navarin in 1972. They will participate in scientific studies at Soviet stations during the 17th Soviet Antarctic Expedition.

B. BIOLOGICAL SCIENCES

B-10012
Uchida, T.
MEDUSAE FROM THE ANTARCTIC. Antarctic record, Jan. 1971 No.39, p.71-75

Four medusae, 3 hydromedusae and 1 scyphomedusa from the Antarctic, including a new species of Rathkea, the genus hitherto only known in the Northern Hemisphere, are described. The collection contains Halitiara sp., Calycopsis borchgrevinki (Browne, 1910), Rathkea antarctica n. sp., and Cyanea juv.

B-10013
Taylor, R.H.
INFLUENCE OF MAN ON VEGETATION AND WILDLIFE OF ENDERBY AND ROSE ISLANDS, AUCKLAND ISLANDS. New Zealand journal of botany, June 1971 9(2), p.225-268, 87 refs.
QK1.N56

Much of the present vegetation on Enderby and Rose Is. has been induced by fire and introduced mammals, the legacy of a period of shipwrecks and attempts at settlement and farming. Large areas of short sward and of dead trees now occur. Tussock grassland has practically disappeared from Enderby, but still covers much of Rose I. Mice, rabbits and feral cattle occur in Enderby, and rabbits alone on Rose I. On Rose I. where tussock and scrub are increasing, rabbits have markedly declined since 1954, whereas on Enderby an apparent balance has been reached between the introduced mammals and the much modified vegetation. The history and present status of bird and seal populations are described. After early exploitation and virtual extermination, southern royal albatrosses and seals are now increasing. On Enderby there are breeding sea-lions, many native bird species, cattle, and rabbits all in an interacting relationship which is obviously not detrimental to any of them or to the present vegetation. The Auckland Is. have been reserves for the preservation of flora and fauna since 1934 and are potentially valuable for studying interactions between native and introduced species.

B-10030
Rastorfer, J.R.
VEGETATIVE REGENERATION AND SPOROPHYTE DEVELOPMENT OF BRYUM ANTARCTICUM IN AN ARTIFICIAL ENVIRONMENT. Hattori Botanical Laboratory. Journal, Jan. 1971 No. 34, Ohio State University. Institute of Polar Studies. Contribution No.177, p.391-397

The development of sporophytes in field samples of Bryum antarcticum collected in Miers Valley, southern Victoria Land, and cultivated under artificial conditions is discussed. Two groups of new gametophores were produced from the specimens by lateral branching. Group I gametophores had dark green leaves, were sterile, and had several archegonia or a single sporophyte with mature archegonia. In contrast, Group II gametophores contained light, yellowish-green leaves and were either sterile or had several antheridia. Observations indicate that the development of sporophytes was initiated by the antherozoids in the antheridia of the Group II gametophores subsequently fertilizing the eggs in the archegonia of the Group I gametophores. However, the absence of antheridia in Group I does not rule out the possibility that they were present earlier, and thus had produced antherozoids which fertilized the eggs, leading to the crop of sporophytes.

B-10034
Arnaud, P.M.
MYTILUS AND AULACOMYA MUSSEL-BEDS OF THE KERGUELEN ISLANDS (SOUTH INDIAN OCEAN). "THE THRESHOLD MUSSEL-BEDS" AND THEIR POSSIBLE INTEREST FOR THE AQUICULTURE OF PELECYPODA. Les moulières à Mytilus et Aulacomya des îles Kerguelen (sud de l'Océan Indien). Les "moulières de seuil" et leur intérêt possible pour l'aquaculture des Pélécypodes. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Serie D, March 8, 1971 272(10), p.1423-1425
Q2.A26

Mytilus and Aulacomya mussel-beds at the mediolittoral and infralittoral stages of the Kerguelen Islands become exceptionally well developed on threshold bars protecting small inlets and fjords. This phenomenon is connected with the richness of plankton carried by tidal currents. The principle of "threshold mussel-beds" appears to be applicable to the aquiculture of pelecypoda under certain favorable topographic conditions or with the aid of artificial reefs.

B-10035
Stirling, I.
POPULATION ASPECTS OF WEDDELL SEAL HARVESTING AT MCMURDO SOUND, ANTARCTICA. Polar record, May 1971 15(98), p.653-667, 23 refs.
G575.P6

The reaction of the Weddell Seal population to human harvesting was a decrease in the size of the breeding population during 1956-1960. By about 1960-1961 the population probably began to expand despite continued killing. By about 1962 the population had expanded to about 2500 so that the removal of limited numbers was negligible in its effect. With continued expansion, crowding occurred bringing density-dependent factors into effect decreasing the population to just over 2000 in 1968, stabilizing at this figure. Because the Weddell Seal population in McMurdo Sound is stabilizing both with the environment and with a continuous low level of harvest, changes of population parameters should be accurately documented to fully assess the effect of harvesting on a natural population.

B-10051
Beliaeva, N.V.
QUANTITATIVE DISTRIBUTION OF PLANKTONIC FORAMINIFERA IN ATLANTIC OCEAN SEDIMENTS. Kolichestvennoe raspredelenie planktonnykh foraminifer v osadkakh Atlanticheskogo okeana. Okeanologiia, Nov.-Dec. 1970 10(6), p.1016-1127, In Russian with English summary. Eng. transl. in: Oceanology, 10(6):820-830, July, 1971. 53

refs.

Low concentrations of planktonic Foraminifera are found on the continental shelves of all the latitudinal zones and on the upper part of the continental slope at high latitudes. This distribution is related to the low concentration of these organisms in the water above the shelves and to terrigencus dilution. Their abundance increases with depth. Maximum concentrations occur on under- water ridges and swells and on the ocean floor at depths not exceeding the "critical" ones. The "critical" depth ranges from 3500 to 4000 m at high and from 4500 to 5000 m at low latitudes. No planktonic Forminifera have been found on the bottom of deep-sea basins at depths of more than 4000 m in the boreal and notalian regions or at depths of more than 5000 m in the tropics. The results of studies on foraminifera at 45 stations S of 60 S show that frequency of occurrence is lowest for the zone as a whole and for individual depths. The foraminiferan fauna consists entirely of the family Globigerinidae, and the species Globigerina pachyderma is particularly widespread.

B-10063
Hada, Y.
PROTOZOAN PLANKTON OF THE ANTARCTIC AND SUBANTARCTIC SEAS. Japanese Antarctic Research Expedition. Scientific reports, Aug. 1970 B(31), 51 p., 52 refs.

The study of the protozoan plankton is based on the material of surface water collected from the seas between Antarctica and Africa during the third and fifth voyages of the Soya (1957-1958; 1959-1960). From these plankton samples, 31 flagellates, a single pelagic foraminifer and 44 ciliates have been secured. Of the total 76, 18 are new species or new varieties, including one new genus. From the study it is clear that the species of the following three orders occur frequently in surface water of the southern antarctic area of the Indian Ocean: the Dinoflagellida including the unarmored genera, Amphidinium, Gymnodinium and Gyrodinium and the armored genus, Peridinium, the Oligotrichida having the marine common genus, Strobilidium, and the Tintinnida comprising the characteristic genera peculiar to antarctic waters, Laackmanniella, Protocymatocylis and Cymatocylis. Furthermore, the highest frequency of occurrence of the protozoan plankton has been observed in the materials obtained from surface water of 0-5 C in the antarctic seas.

B-10067
Hudson, R.
WHITE-PHASE GIANT PETRELS OF THE SOUTH ORKNEY ISLANDS. Ardea, 1968 56(1/2), p.178-183, 11 refs.

The bird making data of the British Antarctic Survey has been used to assess the proportion of white-phase birds in the South Orkney population of the Giant Petrel Macronectes giganteus and whether these migrate north as juveniles as do the dominant dark-phase birds. It is found that the proportion of white-phase chicks reared on Signy I. is 9.1 percent. An analysis of the recoveries shows that the majority of white juveniles do migrate north; it seems possible however that some (perhaps one-quarter) remain within the Antarctic, but the data on which this suggestion is based is statistically significant only at the 10 percent level. The geographical distribution of recoveries in low latitudes does not vary significantly between the two morphs.

B-10068
Kooyman, G.L. , Drabek, C.M., Elsner, R., Campbell, W.B.
DIVING BEHAVIOR OF THE EMPEROR PENGUIN, APTENODYTES FORSTERI. Auk, Oct. 1971 88(4), p.775-795, 30 refs.

The diving behavior of the Emperor Penguin was studied by several means: (1) direct observation from the ice edge, (2) an observation chamber, (3) scuba, and (4) direct measurement of dive depths using two kinds of depth-recorders. Dive durations were determined for 238 dives and the maximum submergence was over 18 min. Of 40 depth measurements obtained, the maximum was 265 m. The most rapid depth change rate was a short ascent of 120 m/min; during such maneuvers the birds' buoyancy seems to assist them greatly. Average swimming speed for birds between two holes 27 m apart ranged from 5.4 to 9.6 km/hr. Respiration was deep and rapid after prolonged dives, whereas after short dives or while resting in the water it became slow with a very extended expiratory phase. The onset of shivering was much delayed in birds diving actively when compared to those just resting in water. During experimental dives single birds were often noticeably confused and uncertain of the location of the breathing hole. The birds seemed to rely on vision for under-ice orientation.

B-10069
Wood, R.C.
POPULATION DYNAMICS OF BREEDING SOUTH POLAR SKUAS OF UNKNOWN AGE. Auk, Oct. 1971 88(4), p.805-814, 14 refs.

The population dynamics of about 110 breeding pairs of individually marked South Polar Skuas of unknown age were studied at Cape Crozier on Ross I., Antarctica, over 8 consecutive breeding seasons. Skua pairs maintained their pair bond from year to year unless one bird failed to return, and reoccupied the previous territory. Breeding success averaged 0.34 fledglings per breeding pair for 5 yr. The annual rate varied widely from 0.12 to 0.60 chicks. The wider disparity of success between South Polar Skuas and Brown Skuas is partly due to the latter's larger breeding territories where 2 chicks are often fledged. Length of pair bond and breeding success were closely correlated. The low rate of success of 36 pairs without previous experience together, 69 percent of which laid eggs during the latter third of the 6-week laying period, suggested that behavioral difficulities in pair formation were partly responsible. The annual survival of adult skuas with breeding experience averaged 93.8 per cent for 4 yr, the highest yr being 97 percent. There was no difference in survival of males and females.

B-10071
Lindsay, D.C.
NOTES ON ANTARCTIC LICHENS: I. NEW RECORDS FOR BUELLIA AND RINODINA. British Antarctic Survey bulletin, June, 1971 No.24, p.11-19, 5 refs.

QH84.2.B72

New locality and habitat data are presented for 12 species of Buellia and 3 of Rinodina. A new combination, Buellia granulosa f. incrassata (Hue) D.C. Lindsay is reported.

B-10074
Conroy, J.W.H.
WHITE-PHASE GIANT PETREL OF THE SOUTH ORKNEY

ISLANDS. British Antarctic Survey bulletin, June, 1971 No.24, p.113-115, 8 refs.
QH84.2.B72

In recent years there has been a suggestion that in the polymorphic giant petrel Macronectes giganteus the white color phase has a preference for the high polar latitudes, and tends to remain there throughout the year, while the dark color phase migrates to lower latitudes. This hypothesis was first tested by Hudson (1968; B-10067) who concluded that possibly 25 percent of the white-phase birds remained in polar regions. Some of his data have been shown to be incomplete and this paper attempts to reassess the situation. Using only "complete data", there seems to be no difference between the proportion of low latitudes. It is concluded that, at least in the juvenile population, there is no evidence of a differential migration of color phases within the species.

B-10075
Lindsay, D.C.
NOTES ON ANTARCTIC LICHENS: II. THE GENUS PELTIGERA. British Antarctic Survey bulletin, June, 1971 No.24, p.115-118, 12 refs.
QH84.2.B72

Three species of Peltigera are recorded from the Subantarctic island of South Georgia and two species from the Antarctic Peninsula-Scotia Ridge sector of the maritime Antarctic. (Auth.)

B-10076
Lindsay, D.C.
NOTES ON ANTARCTIC LICHENS: III. CYSTOCOLEUS NIGER (HUDS.) HARIOT. British Antarctic Survey bulletin, June, 1971 No.24, p.119-120, 5 refs.
QH84.2.B72

Cystocoleus niger (Huds.) Hariot is reported from South Georgia and several localities on the Antarctic Peninsula and islands of the Scotia Ridge, and it is the first record of this genus from within the Antarctic botanical zone. (Auth.)

B-10080
Holdgate, M.W.
BIOLOGY. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.7-22, Refs.
QC801.3.S6

Achievements in Antarctic biology are discussed with emphasis on the IGY and post-IGY period from 1955 to 1960. Prior to the IGY, biological activities stressed widespread collecting and taxonomic and biogeographical studies. Although detailed research on selected species, especially of birds and mammals, had begun, there was still a great need for ecological research. During the 1955-1960 period expansive biological studies were carried out on birds, mammals, fish, and terrestrial and freshwater flora and fauna. The greatest expansion occured in the McMurdo Sound area in the field of marine biology. Other areas of considerable research activity included the circum-Antarctic oceans and the oceanic islands of the circum-Antarctic seas. Medical research and human physiological investigations were also conducted during this period. It is suggested that IGY provided the stimulus that led directly to the great expansion in biological work during the succeeding years. The progress of this expansion beyond 1960 is briefly reviewed.

B-10095
Baldwin, J.
ADAPTATION OF ENZYMES TO TEMPERATURE: ACETYLCHOLINESTERASES IN THE CENTRAL NERVOUS SYSTEM OF FISHES. Comparative biochemistry and physiology, Sept. 1971 40(1B), p.181-187, 13 refs.

Arrhenius plots of log Vmax vs. 1/temperature for acetylcholinesterase (AChE) from the brains of fishes experiencing different thermal environments are essentially parallel throughout the habitat temperature ranges of the animals, indicating similar energies of activation. The affinity of the AChE enzymes for the substrate acetylcholine (ACh) varies with assay temperature and approaches a maximum value (minimum Km) at the lower end of the habitat temperature range. It is considered unlikely that the adaptive significance of the Km-temperature effect lies in the stabilization of reaction rates throughout the habitat temperature range. Brains from 5 species of fish were used in the experiments, including the Antarctic species Trematomus borchgrevinki captured in McMurdo Sound.

B-10098
Crawshaw, L.I. , Hammel, H.T.
BEHAVIORAL THERMOREGULATION IN TWO SPECIES OF ANTARCTIC FISH. Life science, Sept. 1971 10/1(17), p.1009-1020, 12 refs.
QH301.L55

The teleost fish Notothenia coriiceps and Chaenocephalus aceratus were guided from a preferred chamber containing 1.5-3.0 C water into an adverse chamber with the water at 3.0-7.5 C. In both species, the time taken to return to the preferred chamber (escape latency) was inversely related to the temperature difference between the two chambers. C. aceratus exhibited more sensitive thermal selection behavior than N. coriiceps. Heating the diencephalon of N. coriiceps decreased escape latencies, while diencephalic cooling led to increased escape latencies. (Auth.)

B-10105
Müller-Schwarze, D.
SOME QUESTIONS ABOUT PENGUINS. Pacific discovery, July-Aug. 1968 21(4), p. 18-24
Q1.P15

Behavior, geographic distribution, breeding and reproduction (at large and in captivity), and fossils of penguins are described. Various elements that make up the special appeal of penguins are analyzed. The possible evolutionary stages of the sphenisciformes both in the Southern and Northern Hemisphere are traced back to their Pliocene ancestry.

B-10122
Mejia, R.H. , Pinto, J.E.B.
CIRCULATORY FUNCTION IN PAPUA PENGUINS (PYGOSCELLIS PAPUA). La función circulatoria en el pinguino papua (Pygoscellis papua). Buenos Aires. Instituto Antártico Argentino. Contribución, 1970 No. 128, 14p., In Spanish with English, French, German and Italian summaries. 6 refs.

Research on the circulatory system of penguins was carried out at Almirante Brown Station during the 1967-68 summer Antarctic expedition. Measurements of the cardiac minute volume and mean arterial pressure were made and electrocardiograph registrations were obtained by using the classical unipolar, bipolar shunts and modified precordials. From these parameters, the cardiac frequency and the total peripheric

resistance were determined. The thermodynamical and electrocardiographical studies do not allow an adequate analytical comparison, due to the lack of studies in other birds which live in ecological conditions similar to those of the penguin. (Auth. mod.)

B-10126
Makarov, R.R.
COMPOSITION OF THE POPULATION AND REPRODUCTION OF EUPHAUSIA SUPERBA DANA. Nekotorye dannye o sostave populiatsii i osobennostiakh razmnozheniia Euphausia superba Dana. Okeanologiia, Jan.-Feb. 1971 11(1), p.90-98, In Russian. 19 refs. English translation in Oceanology, 11(1): 73-80, 1971
GC1.A47A23

Data collected by the Akademik Knipovich in the Scotia Sea and northern part of the Weddell Sea in Jan.-March 1965 and in 1967 show that the Euphausia superba population consists of two main age groups, adolescent and mature, which differ by one year. A relatively smaller number of large immature krill was also found. Comparison of the age composition of krill caught during the two voyages, reveals that crustaceans of all the groups were smaller in size in the colder 1967, than in the warmer 1965, when the period of rapid growth started earlier. The delay in the start of the spawning phases in 1967 compared to that in 1965 was due to the same phenomenon.

B-10129
Tsyganov, V.A. , Konev, IU.E., Kamyshko, O.P., Riabinin, I.F., Podolian, L.A.
IDENTIFICATION AND MORPHOLOGICAL AND CULTURAL PROPERTIES OF ACTINOMYCETES FROM ANTARCTICA. Microbiology, 1971 39(5), p.714-718. Translated from Mikrobiologiia, 39(5):821-826, Sept.-Oct. 1970. 21 refs.
QR1.M653

Cultures with white and light pink aerial mycelium and brown colonies predominated among 273 actinomycetes isolated from the soils of Antarctica. Most of the strains produced straight sporophores. Some of the actinomycetes correspond to such widespread species in the middle latitudes as Actinomyces albus (7 strains), A. candidus (4), A. chromogenes (10), A. glebisporus (10), A. globosus (33), A. griseus (10), A. lavendulae (14), A. parvus (16), and A. pheochromogenes (14). A minority of the strains isolated exhibited antagonism for gram-positive bacteria or fungi (11 and 12.4% of the isolates, respectively). For original Russian article see B-9258. (Auth. mod.)

B-10139
Vinogradov, M.E.
STUDY OF PLANKTON DURING IGY CRUISES. Annals of the International Geophysical Year, 1969 46, p.197-209
QC801.3.S6

Plankton in the northern part of the Atlantic and Pacific Oceans, the Antarctic, and some coastal areas was studied in particular detail during the IGY. Data were collected in the Antarctic by the Ob' during its 1st, 2nd, and 3rd cruises. Charts of plankton distribution were compiled and a zoning diagram of the southern part of the Indian and Pacific Oceans showing the phytoplankton and the composition of Calanoida in the upper 500 m level was drawn. The quantitative distribution of plankton in Antarctic waters relative to its seasonal state is discussed. The boundary of the Antarctic phytogeographical zone approximately coincides with the Antarctic Convergence. The zoning of zooplankton coincides excellently with phytozoning. All the mass species of Calanoides are characteristic of the Antarctic region.

B-10140
Beliaev, G.M.
STUDY OF SEA FLOOR FAUNA CONDUCTED BY THE SOVIET UNION DURING THE IGY AND IGC. Annals of the International Geophysical Year, 1969 46, p.210-216, 26 refs.
QC801.3.S6

Under the IGY and IGC programs Soviet studies of bottom fauna emphasized the quantitative, vertical and geographical distribution of benthic fauna, their systematic composition, and the bottom fauna of deep-sea ocean trenches. In the Indian Ocean, Subantarctic and Antarctic waters were studied in the greatest detail during 3 cruises of the Marine Antarctic Expedition on the Ob'. From the volume of new data obtained on the quantitative distribution of bottom fauna, charts showing this distribution were plotted for the eastern part of the Bering Sea, the northern part of the Pacific Ocean, the Tasman Sea, and Antarctic waters south of New Zealand. The greatest abundance of fauna was observed in shallow coastal regions of the temperate and polar geographical zones. The Subantarctic waters of the Indian Ocean showed a quantitative index of 0.5-0.8 g/sq m.

B-10144
Kooyman, G.L. , Kerem, D.H., Campbell, W.B., Wright, J.J.
PULMONARY FUNCTION IN FREELY DIVING WEDDELL SEALS LEPTONYCHOTES WEDDELLI. Respiration physiology, Aug. 1971 12(3), p.271-282, 19 refs.
QP121.A1R4

Minute volume, tidal volume, dead space volume (VE, VT, VD), and diving lung volume were measured in adult, unrestrained Weddell seals, Leptonychotes weddelli, whose mean weight was 425 kg. The effects of oxygen ventilation on dive duration were observed in 4 adult seals. VE ranged from 19.5 L/min while resting to 224 L/min after a dive, VT was 5.4 L to 15.2 L, the average VD for 2 animals was 1.6 L, and lung volumes ranged from 5 L during a dive to 21 L after inspiration. Dive durations of 66 min and probably 87 min were observed after oxygen ventilation. The results indicate that the ability to increase ventilation rate above the resting value, is less than that in terrestrial mammals. Diving lung volumes are large enough that blood and tissue inert gas tensions could increase to several atmospheres during deep dives if small air ways closed at low pressures and most of the gases were trapped in the lungs. Blood oxygen tensions may play a primary role in influencing the length of the dive. (Auth.)

B-10170
Zenkevich, L.A. , Filatova, Z.A., Beliaev, G.M., Luk'ianova, T.S., Suetova, I.A.
QUANTITATIVE DISTRIBUTION OF ZOOBENTHOS IN THE WORLD OCEAN. Kolichestvennoe raspredelenie zoobentosa v Mirovom okeane. Moskovskoe obshchestvo ispytatelei prirody. Biulleten'. Otdel biologicheskii, May-June 1971 76(3), p.27-33, In Russian with English summary. 39 refs.
QL60.M8

For the first time a schematic map has been compiled showing the distribution of the biomass

of zoobenthos in the World Ocean. The map is based on data obtained in different regions of the ocean, including Antarctic waters, mainly by Soviet expeditions. The mapping of regions still insufficiently known was done by extrapolating the data obtained for other regions, taking into account the general patterns of bottom fauna distribution. Data available correctly characterize the order of values of the biomass of multicellular bottom animals in different regions of the ocean. Highly characteristic is the concentration of bottom fauna near the coasts of continents (including Antarctica) and islands. A resemblance is observed between the distribution of zooplankton and zoobenthos biomasses in the World Ocean. (Auth. mod.)

B-10176
Gressitt, J.L. ed
ENTOMOLOGY OF THE AUKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND. Pacific Insects monograph 27, Honolulu, Bernice P. Bishop Museum, 1971, 340p., refs.
QL461.P218

This volume opens a series of reports on several expeditions to the Auckland Islands and other islands south of New Zealand, including the Bounty, Snares and Antipodes Islands. Some new information is also included on the fauna of Campbell Island. The majority of the material for these studies was collected on two expeditions to the Auckland Is, in 1962-63 and in 1966, organized by the Dominion Museum (Wellington) and the Department of Scientific and Industrial Research (DSIR) of New Zealand, with participation by Canterbury University, Bishop Museum, Auckland Institute and Museum and other organizations. Material from several other expeditions is included: University of Canterbury Antipodes Island Expedition in 1969; The University of Canterbury in the Snares between 1961 and 1968, and Bounty Islands in 1968. For abstracts of papers see B-10177 to B-10188.

B-10177
Gressitt, J.L., Wise, K.A.J.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: INTRODUCTION. Pacific Insects monograph, Nov. 10, 1971 No.27, p.1-45, 111 refs.
QL461.P218

The Aucklands, Bounty, Snares and Antipodes are Southern Cold Temperate (or Low Subantarctic) islands south of New Zealand and north of Campbell I and Macquarie I. The Auckland group is the largest of all these islands south of New Zealand, and has by far the largest fauna. The Snares, Bounty and Antipodes, though farther north, are quite small islands with limited fauna. These islands have vegetation dominated by tussock grass, bogs with sedges and cryptogams, and shrubs at lower altitudes and in some cases forests of Metrosideros or Olearia near the shores, usually in more protected environments. Bounty Is have almost no vegetation. These islands are breeding places for many sea birds and for hair seals and fur seals. The insect fauna of the Aucklands numbers several hundred species representing most major orders of insects and other land arthropods. This is the introductory article to the first volume treating the land arthropod fauna of the Auckland, Snares, Bounty and Antipodes Islands. (Auth.)

B-10178
Peters, W.L.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: EPHEMEROPTERA: LEPTOPHLEBIIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.47-51, 7 refs.
QL461.P218

A new species, Atalophlebioides aucklandensis, is described from the Auckland Islands. The species is known from the male and female imagos and nymphs. This is the first record of Ephemeroptera from the subantarctic islands south of New Zealand. (Auth.)

B-10179
Wise, K.A.J.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: NEUROPTERA: HEMEROBIIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.53, 1 ref.
QL461.P218

Although no Neuroptera have been taken on Campbell Island, one species, Micromus tasmaniae (Walker, 1860), has been collected on and is recorded from Auckland Is and Antipodes Is, south of New Zealand. This is a widespread species which also occurs throughout New Zealand and on Chatham Is (Wise 1963).

B-10180
Dugdale, J.S.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: LEPIDOPTERA, EXCLUDING NON-CRAMBINE PYRALIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.55-172, 95 refs.
QL461.P218

This paper deals with all Lepidoptera, excluding the non-crambine Pyralidae, of Auckland, Campbell, Antipodes and Snares Is. The native resident fauna of these islands consists of 42 species of which 21 (50 percent) are endemic, in 27 genera, of which 3 (11 percent) are endemic, in 12 families. The endemic fauna is characterized by brachyptery (66 percent), body size under 10 mm (72 percent) and concealed, or strictly ground-dwelling larval life. All species can be related to mainland forms; there is a distinctive pre-Pleistocene element as well as some instances of possible Pleistocene introductions, as suggested by the presence of pairs of species, one member of which is endemic but fully winged. A graph and tables are given showing the composition of the fauna, its distribution, habits, and presumed derivations. Host plants or host niches are discussed. An additional 7 species are considered to be non-resident waifs. The taxonomic part includes keys to families (applicable only to the subantarctic fauna), and to genera and species. Existing species and genera are redescribed, and where necessary, new combinations and synonymies are established. Two new genera, 9 new species and 4 new subspecies are described. Drawings of genitalia and other parts of all native species are given. (Auth.)

B-10181
Townsend, J.I.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: COLEOPTERA: CARABIDAE: BROSCINI. Pacific Insects monograph, Nov. 10, 1971 No.27, p.173-184, 9 refs.
QL461.P218

Three genera and 3 species of Broscini occur on the subantarctic islands of New Zealand, 2 on the Snares and 1 on the Bounty. The 2 genera from the Snares are related to the fauna of different parts of New Zealand--Diglymma to the

fauna of western Fiordland and Mecodema to that of Stewart Island and the southern part of the South Island. Bountya insularis n. gen., n. sp. from the Bounty Is. is placed in the subtribe Creobiina which has not been previously recorded from the New Zealand biogeographical area, but has related genera occuring in Australia and South America. Figures of genitalia and photographs of adults and larvae are given. (Auth.)

B-10182
Ordish, R.G.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: COLEOPTERA: HYDRAENIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.185-192, 11 refs.
QL461.P218

The family Hydraenidae is represented by 3 endemic species of Meropathus Enderlein, M. campbellensis Brookes on Campbell and Antipodes Islands, M. johnsi n. sp. on the Snares, which are closely related to 2 undescribed species from Stewart and Chatham Islands. The new species are described after a comparison of both male and female genitalia. The bearing that the form of these organs have on higher classification, and the distribution and habitats of the genus are briefly discussed, together with the diagnostic limitations of external morphology. (Auth.)

B-10183
Watt, J.C.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: COLEOPTERA: SCARABAEIDAE, BYRRHIDAE, PTINIDAE, TENEBRIONIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.193-224, 15 refs.
QL461.P218

Adults of all species of these families known to occur on New Zealand's subantarctic islands are described or redescribed, new synonymy and recombinations are noted, and larvae are described where known. Aspects of the higher classification of Byrrhidae and Tenebrionidae are discussed, and a subfamily Lagriinae is defined within the latter family. The family Scarabaeidae is represented only by Prodontria longitarsis (whose larva is described for the first time) on Snares. The family Byrrhidae is represented by 4 species of Epichorius and one temporarily referred to Synorthus. Epichorius is shown to be generically distinct from Liochoria, and is reinstated and redefined. E. sorenseni is newly recorded from Macquarie Island. The only ptinid is the cosmopolitan Ptinus tectus. The family Tenebrionidae is represented by a specifically or subspecifically distinct population of Pseudhelops on each island or group, and with 2 species occurring sympatrically on Antipodes Islands. Pseudhelops is redefined, its systematic position is discussed, and species from New Caledonia and India are excluded.

B-10184
Kuschel, G.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: COLEOPTERA: CURCULIONIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.225-259, 13 refs.
QL461.P218

This is a supplementary report to that published on the Curculionidae from Auckland, Campbell, Antipodes, and Snares Islands (no species are known from Bounty or Macquarie) and is based on some 2000 additional specimens collected during further trips to the islands. The native fauna now contains 17 genera and 35 species belongint to 9 subfamilies, 4 genera (23.53%) and 21 species (60.0%) being endemic. All genera and species have their closest relatives in the New Zealand mainland. A significant fact is that none of the true wood borers, flower dwellers, or leaf miners is endemic, and that the larvae of all the endemic species live either in the soil (76.33%) or in decaying plants (23.67%). Further discussions on the composition of the fauna are presented. The fauna is also compared with that of other cold-temperate areas of the southern hemisphere. Apart from a general key to the genera, separate keys to the species are given for the Aucklands, Campbell, and the Snares. A few nomenclatural changes were necessary after an examination of some type material previously not available. (Auth.)

B-10185
Holloway, B.A.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: COLEOPTERA: ANTHRIBIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.261-270, 3 refs.
QL461.P218

Two species of Anthribidae occur on the New Zealand Subantarctic Islands, Cacephatus aucklandicus (Brookes) on the Aucklands and Snares and Lichenobius littoralis Holloway on the Snares. Both are found also on the southern mainland of New Zealand. The species are redescribed and illustrated. (Auth.)

B-10186
May, B.M.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: IMMATURE STAGES OF CURCULIONOIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.271-316, 13 refs.
QL461.P218

The larvae of 19 curculionid and 2 anthribid weevil species inhabiting the Subantarctic Islands of New Zealand, and the pupae of 9 of them, are described and figured. Subfamily and generic definitions are included and a key is given for larval separation. (Auth.)

B-10187
Duckhouse, D.A.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: DIPTERA: PSYCHODIDAE. Pacific Insects monograph, Nov. 10, 1971 No.27, p.317-325, 6 refs.
QL461.P218

Two new and 4 previously described species of Psychodidae are recorded from the Auckland Is (5 in Psychoda, 1 in Threticus). The relationships of subantarctic island psychodids is discussed and a key is provided for their identification. The report is based upon collections made in the Auckland Is., and on Antipodes I.

B-10188
Valentine, E.W.
ENTOMOLOGY OF THE AUCKLANDS AND OTHER ISLANDS SOUTH OF NEW ZEALAND: HYMENOPTERA: MYMARIDAE. Pacific Insects monograph, Nov. 10, 1971 27, p.327-333, 6 refs.
QL461.P218

Three species in 3 genera of Mymaridae are reported from the subantarctic islands of New

Zealand; all species and 2 genera are described as new. One species each is known from the Aucklands and Campbell I, while a third occurs on Auckland, Campbell and Antipodes Is. They are related to species from the New Zealand mainland. Each species is illustrated. (Auth.)

B-10195
Braxton, D.
GROWING AWARENESS OF POTENTIAL ANTARCTIC FISHERIES. Australian fisheries, June 1971 30(6), p.10-13
SH131.A35

The substantial fisheries resources of Antarctic and Subantarctic waters and their commercial utilization are discussed. Currently a number of countries conduct fisheries research in these waters, including Australia, New Zealand, Japan, Gt. Britain, the U.S. and the U.S.S.R. The resource of most interest commercially is krill. Other fisheries under investigation include elephant fish, tarakihi, general fish, edible crabs, fish parasites, benthos, plankton, albacore, seals, and whales. Antarctica has an impressive list of mineral resources, as yet not proved worthy of economic development. In addition, the region is rich in animal and bird life.

B-10196
FOSSIL FISH 350 MILLION YEARS OLD FOUND IN TRANSANTARCTIC MOUNTAINS. Australian fisheries, June 1971 30(6), p.14-15
SH131.A35

The fossil fish fauna found in the Transantarctic Mts by Australian scientists included representatives from several major groups: Bothriclepis, primitive armor plated fish about 15 in. long; smaller 6 in. specimens belonging to the paleoniscid group; the lobe-finned crossopterygians; and the lobe-finned fish. The biological importance of the crossopterygians lies in the fact that they gave rise, during the Devonian period to the first amphibians. The crossopterygian group is presently represented by a single living form, Latimeria. A detailed comparison of the fossil fish faunas from Antarctica and Australia to try and correlate the the rock strata between the two continents is proposed.

B-10208
FASCINATING WORLD OF ANIMALS. Pleasantville, N.Y., Reader's Digest, 1971., 428p., Numerous refs.
QL50.R29

In a section on The Polar Regions the two frigid zones are described as occupying corresponding spots on the globe and having a common frigid climate; but each a different environment that supports different species of plants and animals. These species are dominated by the longest days and nights, the lowest temperatures, and strongest winds; and warm-blooded polar animals have body systems and behavior patterns that help them survive constant near-freezing temperatures. Seals, whales, penguins and other birds of the Antarctic and sub-Antarctic islands are further described. Antarctic relevance is also included in sections on two other biomes, Oceanic Islands and Oceans. The volume is profusely illustrated in color for an excellent presentation.

B-10210
Theyer, F.
BENTHIC FORAMINIFERAL TRENDS, PACIFIC-ANTARCTIC BASIN. Deep-sea research, July 1971 18(7), p.723-738, 32 refs
GC1.D25

Benthic foraminiferal communities, living in depths of about 3000-5100 m in the Pacific-Antarctic Basin, consist mostly of cosmopolitan abyssal species. The assemblages are generally over 85 percent arenaceous in composition; a few, however, from depths of 3000-4000 m, are predominantly calcareous. Correlative with the uniformity of the environment, faunal trends, if present, are poorly developed. Four bathymetric foraminiferal groups can be distinguished considering the upper depth limits of occurrence of prominent species: Hyperammina subnodosa Brady; Reophax pauciloculatus Rhumbler; Hormosina robusta Pearcy; and Cyclammina pusilla Brady. Frequency changes in the above groups define two faunal boundaries: one at 3500 m, and a second, weaker one, at 4800-5000 m. Among ten species selected because of their abundance in western Antarctic seas, Recurvoides contortus Earland has the widest depth range (20-6200 m), and Hormosina robusta Pearcy has the narrowest one (3000-5100 m). Cribrostomoides subglobosus (Sars) and Cyclammina pusilla Brady are most abundant in the bathyal and abyssal zones of the western Antarctic sector. (Auth. mod.)

b-10211
Horowitz, N.H.
SEARCH FOR LIFE ON MARS: WHERE WE STAND TODAY. Bulletin of the Atomic Scientists, November 1971 27(9), p.13-17
TK9145.A84

The prospects for life on Mars are examined and comparison is made between the biological environments of Mars and the dry valleys of South Victoria Land, Antarctica. The constant dryness and low temperature make the dry valleys interesting as a quasi-Martian environment. Experiments have shown that the life of the dry valleys is almost entirely microbial and that the life-limiting factor is water. The evidence suggests that excluding the lakes, the dry valleys are abiotic. This implies that terrestrial microorganisms carried to Mars could not contaminate the planet and if there is life on Mars it must have evolved special mechanisms for obtaining and retaining water, assuming this to be the Martian biological solvent. The fact that organic compounds have recently been synthesized in soil and pulverized glass under Martian conditions makes the planet far more interesting biologically than it would otherwise be. One American and two Soviet space vehicles are due to reconnoiter Mars this month.

B-10237
Dodge, C.W.
LICHENOLOGICAL NOTES ON THE FLORA OF THE ANTARCTIC CONTINENT AND THE SUBANTARCTIC ISLANDS. VII AND VIII. Nova Hedwigia. Zeitschrift für Kryptogamenkunde, Dec. 1968 15(2-4), p.285-332

Geographic distribution, morphology, and taxonomy of lichens collected by the Australian National Antarctic expeditions on Macquarie I. and by the Chilean Antarctic expeditions between 170 E and 145 W up to 80 S are being studied. Numerous new taxa, in addition to those given previously (see: B-4260), are described, including 49 species, 2 new combinations, and 3 new genera, Thelidiola, Llanoa Dodge, and Eklundia Dodge. (See: B-4259 and B-4260 for parts 5 and 6).

B-10238
Llano, G.A., Johnston, B.R.
[illegible]. Nature, Oct. 1971 233(5322), p.627
A critique is presented of I.M. Johnston's "Bird Numbers and Conservation Problems at Cape Hallett, Antarctica" (See B-9565). In paragraph [illegible], it should be said that the resident penguins were moved from the area selected for establishing Hallett Station into other parts of the rookery. They were not killed or shipped from Cape Hallett as the verb "were removed" might suggest. With reference to paragraph 5, the remark that there was no significant loss of monel-metal bands is unclear. The statement on mean annual loss of breeding skuas, and on the fifty breeding birds lost between 1956 and 1967, requires substantiating data to indicate how these figures were derived. With reference to the last sentence, next to the last paragraph, Cape Hallett is not a Specially Protected Area. In 1970-71, USARP biologists at Hallett Station began the restitution of the natural area; the work is continuing and will result in returning a large part of the land occupied by Hallett Station to the original inhabitants. The 1971-72 scientific work at Hallett Station includes a skua-banding program.

B-10247
Walter, H.
VEGETATION OF THE EARTH FROM THE ECOPHYSIOLOGICAL POINT OF VIEW. VOL. 2: TEMPERATE AND ARCTIC ZONES. Die Vegetation der Erde in öko-physiologischer Betrachtung. Band 2: Die gemässigten und arktischen Zonen. Stuttgart, Gustav Fischer, 1968, 1001p., In German. Refs.
Antarctic terrestrial vegetation in relation to climate and geographic location is discussed in the section "Antarctica and the Sub-Antarctic islands" (p.578-587). On the Antarctic continent only two flowering plant species Colobanthus crassifolius and Deschampsia antarctica were found, the remainder being mosses, algae, fungi, and lichens.

B-10259
Carter, J.R.
SOME FRESH WATER DIATOMS OF TRISTAN DA CUNHA AND GOUGH ISLAND. REPORT ON MATERIAL COLLECTED BY THE ROYAL SOCIETY EXPEDITION TO TRISTAN DA CUNHA 1962 AND THE GOUGH ISLAND SCIENTIFIC SURVEY 1956. Nova Hedwigia. Zeitschrift fUr Kryptogamenkunde, 1966 11(1/4), p.443-483+9plates, 20 refs.
A collection of 10 fresh water-diatom samples from Tristan de Cunha made by the Royal Society Expedition in 1962 and two samples from Gough I made by the Gough Island Scientific Survey in 1956 were studied. New taxa are described: Achnanthes (5 spp.); Amphora (1 sp.); Caloneis (3 spp.); Cyclotella (1 f.); Eunotia (5 spp.); Fragilaria (1 f.); Gomphonema (2 spp.); Melosira (3 spp.); Navicula (9 spp., 1 f.); Nitzschia (10 spp.); Pinnularia (11 spp.); and Pseudoeunotia (2 spp.).

B-10260
Knaggs, F.W.
REVIEW OF THE WORLD DISTRIBUTION AND ECOLOGY OF RHODOCHORTON PURPUREUM (LIGHTF.) ROSENVINGE. Nova Hedwigia. Zeitschrift fUr Kryptogamenkunde, 1967 14(4), p.549-570, 41 refs.
Investigations show that the red alga Rhodochorton purpureum (Lightf.) Rosenvinge is circumpolar in distribution in both the Northern and Southern Hemispheres. In the Southern hemisphere the majority of known locations with the exception of Inaccessible I. (Tristan da Cunha group) lie to the S of 45 S, in the area delimited by the 10 C isotherm, i.e. (R. purpureum is restricted to waters of the Antarctic and sub-Antarctic cold temperature types. R. purpureum has a wide vertical distribution on the shore, extending from the sublittoral to the adlittoral region; in Antarctic waters midlittoral and sublittoral habitats have been reported. Conditions for the geographic distribution of the alga are imposed by a complex of factors of which water temperature, chemical composition of surroudning waters and possibly net annual radiation are the most important.

B-10261
MAN WHO FINDS FOSSILS. Scientiae. July 1971 12(7), p.11-14
Briefly described are the activities of James Kitching (Supervising Field Officer at the Bernard Price Institute for Paleontological Research in Johannesburg) in collecting fossils in America, South Africa, Australia, and Antarctica. From Oct. 1970 to Jan. 1971 Kitching participated in an expedition to Antarctica which was part of the U.S. Antarctic Research Program in the McGregor and Amundsen Glaciers area. In spite of bad weather, the rarefied air at high altitudes and rugged terrain, he and his co-workers collected at least 76 good specimens of fossilized mammal-like reptiles equivalent to those found in the Karroo, Union of South Africa. It is already clear to scientists that what has been found here is perhaps the strongest proof that has yet come to light of the close ligation of Antarctica and Africa during early Triassic times. The paper on the Antarctic finds is the twenty-fifth James Kitching has writeen, either alone or in collaboration with others. In July 1967 the S.A. Association for the Advancement of Science awarded him a certificate of merit, and the American Museum of Natural History has given him an award (April 1969) on the basis of work done at the Smithsonian Institution.

B-10279
El-Sayed, S.Z.
PHYTOPLANKTON STUDIES IN THE SOUTHEASTERN INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.153-154, 1 ref.
Conspicuous variations in the productivity parameters were noted in the four water masses studied (subtropical, Subantarctic, Antarctic Convergence, and Antarctic) during Eltanin Crusie 46. The low levels of production characteristic of the stations occupied in pack ice were in marked contrast to the high productivity found at stations occupied off Heard and the Kerguelen Is. High standing crops of phytoplankton were also noted at the stations in the vicinity of the Convergence (Polar Front). The hydrographic and nutrient data collected during this cruise showed the significant effect of the Polar Front on the distribution and abundance of the nutrient salts and primary producers. In general, higher concentrations of nutrients were found south of the Polar Front rather than north of it, with conspicuous increases from north to south as the Convergence was crossed. With regard to the distribution of the phytoplankton, except for the few stations occupied north of the Subtropical Convergence, where the dinoflagellates were an important component of the phytoplankton, the diatoms were the dominant element par excellence throughout

the study areas. Floral changes in the composition of the phytoplankton were noted at the Polar Front and at the Subtropical Convergence.

B-10280
Eadie, B.J. , Sackett, W.M.
STABLE CARBON ISOTOPE VARIATIONS IN THE ANTARCTIC MARINE ECOSYSTEM. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.154, 2 refs.

In order to further understand the temperature effect on various phases of natural-carbon isotope fractionation and to use natural-carbon isotope compositions to study the fate of carbon as it moves through the antarctic marine ecosystem, samples of all possible species of carbon were collected on Eltanin Cruise 46, to be supplemented by further samples from Cruise 51. Analysis of 13 plankton samples shows a correlation between delta C13 (per mill deviation of the C13/12 ratios of the samples from that of the Chicago PDB) and surface temperature of 0.45 per mill per degree Celcius over the range of -1 to 15 C, about twice that reported by Sackett et al. (1965) for the range of -2 to 27 C. The dependence of fixed organic carbon on the temperature of the surface water is the basis for postulating the possibility of a carbon isotope paleotemperature scale. Examination of the carbon of the upper 10 cm of cores taken on a north-south transect along approximately 115 E shows a decrease in the carbonate concentration, as expected for sediments deposited in colder waters, and a general decrease in the delta C13 of the organic fraction.

B-10281
Bahnweg, G. , Sparrow, F.K., Jr.
MARINE FUNGI: OCCURRENCE IN THE SOUTHERN INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.155, 3 refs.

Preliminary results of the study of marine fungi, particularly saprophytic phycomycetes, during Eltanin Cruise 46 indicate that yeasts are most abundant in the open ocean; high numbers occur particularly at stations close to or in the ice. Some of the yeasts were identified as the smut-like basidiomycetous forms previously reported by Fell (1968; B-6828). Phycomycetes, on the other hand, were primarily recovered from water and benthic materials from the vicinity of Heard and Kerguelen Is. Only a few phycomycetes were recovered from open oceanic water. All of the phycomycetes are nonfilamentous. Some of them could be identified as members of the genera Thraustochytrium and Dermocystidium sensu Goldstein and Moriber while others apparently represent a new genus intermediate between those two. Filamentous higher fungi ("molds") were generally rare, their abundance increasing slightly with proximity to land.

B-10282
Carlucci, A.F. , Holm-Hansen, O., Williams, P.M.
DISTRIBUTION, BIOCHEMICAL ACTIVITY, AND CHEMICAL COMPOSITION OF PLANKTON IN ANTARCTIC WATERS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.155-156

Extensive samplings were made at 16 stations during Eltanin Cruise 46 for study of the following properties: (1) distribution of microbial cells throughout the entire water column; (2) gross and specific chemical composition of phytoplankton, zooplankton, and total particulate matter; (3) depth distribution of particulate and dissolved organic carbon, nitrogen, and phosphorus; (4) distribution of dissolved and particulate vitamins B1, B12, and biotin in depth profiles; (5) species distribution and total biomass of phytoplankton cells from the surface to 100 m depth; and (6) natural radiocarbon activity of phytoplankton, zooplankton, and bathypelagic Crustacea and fishes. These data will be assessed to determine the rate of transfer of photosynthetically fixed carbon from sea surface into the deep ocean. Most of the above samples are still being analyzed. Available data on dissolved vitamins, microbial biomass, and particulate nitrogen and carbon are given.

B-10283
McWhinnie, M.A. , Urbanski, R.J.
ABSORPTION OF SOLUBLE ORGANIC COMPOUNDS BY POLAR MARINE ZOOPLANKTON. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.156-157, 1 ref.

Members of the zooplankton populations, representing five phyla and eight genera, were measured for whole organism respiration and carbon-14 glycine absorption from sea water. All animals were studied at 1 or 3 C and were maintained in sea water. The data show a considerable range in oxygen consumption, with chaetognaths Eukrohnia hamata showing the highest values, followed decreasingly by a pteropod mollusc Clione antarcticus, polychaete annelid Tomopteris carpenteri, amphipod crustacean Parathemisto gaudichaudii, and euphausid crustacean Euphausia triacantha. Treatment of these animals with streptomycin penicillin resulted in an increase in oxygen consumption. C14-glycine absorption from sea water varied with the species employed. Animals treated with antibiotics showed an increase over untreated animals in amino acid incorporation, which also varied with the duration of exposure to the antibiotic.

B-10284
Morita, R.Y. , Gillespie, P.A., Jones, L.P.
MICROBIOLOGY OF ANTARCTIC SEA WATER. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.157, 5 refs.

In order to determine the in situ activity of psychrophilic bacteria during the process of normal mineralization in antarctic waters, uniformly labelled carbon-14 substrates were used for measuring uptake and respiration (mineralization). Different concentrations of these substrates were added to a known volume of a water sample and incubated at the temperature from which the water sample was obtained. Results indicate that a significant degree of mineralization takes place in the ice-laden offshore water. Highest activity was observed near the Antarctic Convergence and the easternmost station near the ice shelf. The microbial activity at stations north of the Antarctic Convergence was nearly unmeasurable. Using water samples taken near the ice shelf (water temperature was -1 C.) the psychrophilic nature of the microbial flora was demonstrated. Significant microbial activity was observed even at -3 C. (lowest temperature tested). Activity increased with increasing temperature with maximum activity at 3 C. Temperatures higher than 3 C depressed the microbial activity.

B-10285
Franceschini, G.A.
OBSERVATIONS OF NET SOLAR RADIATION FOR OCEANIC BIOLOGICAL STUDY. Antarctic journal of the United

States, Sept.-Oct. 1971 6(5), p.157-158

To determine the spectral distribution of solar radiation made available for primary productivity, measurements were made aboard USNS Eltanin during Cruise 46, which took place in the southern Indian Ocean during the austral summer, from Nov. 20, 1970 to Jan. 20, 1971. Hemisphere collectors (Eppley precision spectral pyranometers) were used in sets of four to determine the incident and upwelling fluxes of shortwave radiation above the water over selected wavelength bands. Schott glass filters, with lower sharp cutoffs were employed. The arrangement of the sensors gave unreliable results due to interference by the ship's shadow with the sun astern. The output signals of all sensors were recorded simultaneously on potentiometric strip-chart recorders. Manual processing of the data proved satisfactory.

B-10286
Cummings, W.C. , Thompson, P.O.
BIOACOUSTICS OF MARINE MAMMALS; R/V HERO CRUISE 70-3. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.158-160

On May 5, 1970, the research vessel Hero left Punta Arenas, Chile, in search of marine mammals and birds along the Chilean archipelago and offshore islands. The main purpose of this phase of Cruise 70-3 was to study the sounds of marine mammals encountered from Punta Arenas to Valparaiso, Chile. Numerous sound recordings were made in the presence of blue whales, Balaenoptera musculus, South American fur seals, Arctocephalus australis, Guadalupe fur seals, Arctocephalus philippi, and South American sea lions, Otaria flavescens. A rare opportunity for underwater bioacoustics study occurred at Isla Guafo, southwest of Isla de Chiloe, where four blue whales were sighted on May 30 and 31. The underwater moanings from these animals were the most powerful sounds recorded from living animals - 188 dB, re 1 mu N/sq m at 1m. The scarcity of blue whales makes these recordings extremely valuable.

B-10287
Shabica, S.V.
GENERAL ECOLOGY OF THE ANTARCTIC LIMPET PATINIGERA POLARIS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.160-161, 1 ref.

Studies begun during the austral summer of 1969-70 on the life cycle of Patinigera polaris were continued at Palmer Station through the austral winter. Metersquare samples of P. polaris were collected monthly from 6 levels of the littoral zone. The height of the limpet appears to be an important parameter, as the height to width-length ratio decreases as depth increases. Variations of the shell surface morphology and shell thickness also appear to be related to depth, the latter appearing to decrease with increasing depth. Remeasurement of marked limpets indicated that growth rates are high in smaller limpets and negligible in the larger ones. Diatom fragments made up the greatest percentage of total gut content. P. polaris is dioecious, and fertilization takes place externally. Spawning is probably related to water temperature. Observations made on water temperature tolerance, vertical distribution limits, and predators of P. polaris are also reported.

B-10288
Rastorfer, J.R.
EFFECTS OF TEMPERATURE ON CARBON DIOXIDE COMPENSATION POINTS OF THE MOSS DREPANOCLADUS UNCINATUS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.162-163, 7 refs.

CO2 compensation points were determined at three different temperatures for gametophytes of Drepanocladus uncinatus (Hedw.) Warnst.--of west Antarctic origin but cultured under controlled conditions. The test shoots were sealed in a Plexiglas chamber, which was submerged in a water bath connected to a closed system employing a Beckman model 215 infrared gas analyzer. The light intensity at plant level, was 5.84 mw per sq cm from incandescent reflector lamps. Carbon dioxide compensation points increasing temperatures and values were 32, 50 and 82 parts per million at 5, 15, 25 C, respectively. The values may be higher than normal because of reduced photosynthetic activities resulting from low chlorophyll contents. Nevertheless, this moss can be considered a high compensation species.

B-10364
Cummings, W.C. , Jehl, J.R., Jr., Fish, J.F., Thompson, P.O.
BIOACOUSTICS OF MARINE MAMMALS OFF ARGENTINA: R/V HERO CRUISE 71-3. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.266-268, 2 refs.

This is the first published report of underwater sounds from the southern right whale. Using a calibrated hydrophone system, more than 200 low-frequency whale sounds were recorded in Golfo San Jose during June 21 to 24 and July 1 to 13. Other behavioral patterns of the whales are also described. Resulting from studies of the distribution and ecology of marine birds was the discovery of a small, wintering population of Magellanic plovers around Golfo San Jose and Golfo Nuevo. Evidence was also found for the occasional hybridization of 2 species of oyster catchers in the Golfo San Jose area.

B-10368
Dreux, P.
CONTRIBUTION TO THE STUDY OF TERRESTRIAL AND FRESH-WATER ARTHROPODA OF THE FRENCH SOUTHERN TERRITORIES. Contribution a l'étude des Arthropodes terrestres et d'eau douce dans les Terres Australes Françaises. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan-June 1970 No. 50-51, p.41-44, In French. 16 refs.

Recent discoveries of terrestrial and fresh-water arthropoda on Crozet Islands are summed up. Freshwater crustacea belong to 3 groups and include: (1) Cladocera. Daphniopsis studeri Ruhe Macrothrix hirsuticornis Norman et Brady, and Chydorus sphaericus (O.F. Muller) (2) Copepoda. Pseudoboeckella volucris Kiefer. (3) Ostracoda Tigriopus californicus Baker, and Ilyodromus kerguelensis G.W. Muller. Newly discovered terrestrial arthropoda include Austrochthonius insularis Valeri Di Castri, (a pseudoscorpion), Nuncia unifalculata (Enderlein) (Opilionea), and several spiders.

B-10371
Arnaud, P.M. , Arnaud, F.
COLLECTION OF MARINE INVERTEBRATES MADE IN FRENCH SOUTHERN AND ANTARCTIC TERRITORIES, 1949-1970, AND PLACED IN CARE OF THE ENDOUME MARINE STATION. Collection d'invetebrés marins faites dans les Terres Australes et Antarctiques Françaises, 1949-1970 et confiées à la station Marine

d'Endoume. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-Mar 1971 No.54, p.39-43, In French.

The Endoume Marine Station at Marseille, France, performs a function similar to that of the U.S. Smithsonian Oceanographic Sorting Center in collecting and distributing biological samples. The Station is now responsible for samples obtained by 14 collecting missions. A 3-page table is presented, showing (a) zoological groups to which the sample belongs, (b) origin (place and time of capture), (c) name of the scientist assigned to the study, and (d) location of the study (within the Station, elsewhere in France, or abroad).

B-10372
Voisin, J.-F.
DESCRIPTION OF STERNA VIRGATA MERCURI OF CROZET ARCHIPELAGO. Description de Sterna virgata Mercuri de l'archipel Crozet. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-Mar 1971 No.54, p.44-49, In French with English summary. 11 refs.

The tern Sterna virgata found on the Crozet Is. is described and considered to be sufficiently different from that found on Kerguelen to warrant classing it as a distinct subspecies for which the name Sterna virgata mercuri ssp. nov. is proposed.

B-10374
Cummings, W.C. , Thompson, P.O.
UNDERWATER SOUNDS FROM THE BLUE WHALE, BALAENOPTERA MUSCULUS. Acoustical Society of America. Journal, Oct. 1971 50(4), p.1193-1198

Powerful low-frequency sounds were recorded from blue whales, Balaenoptera musculus, off the Chilean Coast. These three-part sounds lasted about 36.5 sec, and ranged in frequency from 12.5 to 200 Hz. The sounds occurred in a repetitive pattern that was interrupted as the whale came to the surface to breathe. It is estimated that these moanings, in a 14- to 222 Hz band, averaged 88dB re 1 microbar at 1 m. They are the most powerful sustained utterances known from whales or any other living source. This finding is especially noteworthy because it is doubtful if these animals, the largest ever to inhabit the earth, will survive man's overharvest. (Auth.)

B-10380
Bradford, J.M.
FAUNA OF THE ROSS SEA. PART I. PELAGIC COPEPODA. New Zealand. Department of Scientific and Industrial Research. Bulletin, 1971 No.206, p.7-31, 43 refs.

Collections of Ross Sea Copepoda from the Transantarctic Expedition 1956-58 and the New Zealand Oceanographic Institute cruise in the summer of 1958-59 were analyzed and faunal lists of the area prepared. Eighteen species, not including two obvious strays of contaminants from temperate waters, were added to the Ross Sea fauna. A new species of Chiridiella is described along with males of Aetideopsis antarctica and Haloptillus ocellatus. The males of Ctenocalanus vanus and Racovitzanus antarcticus are discussed. Although the fauna generally is an extension of the circumpolar Antarctic fauna, yet a region of distinct faunal differences shows in the southwestern part of the Ross Sea, where Antarctic Circumpolar Water is absent, where no copepod species associated with Antarctic Circumpolar Water occur and where the two "neritic" species are found.

B-10381
Jones, N.S.
FAUNA OF THE ROSS SEA. PART 8. CUMACEA. New Zealand. Department of Scientific and Industrial Research. Bulletin, 1971 No.206, p.33-46, 27 refs.

Fifty specimens distributed among nine species collected by expeditions in HMNZS Endeavour in 1959 and 1960, the Transantarctic (New Zealand) Expedition of 1956-58, and a Stanford University team in 1958-60 are discussed. Three species are described as new -- Procampylaspis meridiana, Paralamprops rossi and Makrokylindrus inscriptus. A key is included to all the known species of Antarctic and Subantarctic Cumacea, which at present number 41. Of the species 93 percent are endemic.

B-10382
Kinsky, F.C.
RECENT OCCURRENCE OF RARE PETRELS IN NEW ZEALAND. Notornis, Sept. 1971 18(3), p.215-216

Recent occurrences in New Zealand of a Soft-plumaged Petral (Pterodroma mollis) a Black-capped Petrel (Pterodroma externa cervicalis), and a Subantarctic Little Shearwater (Puffinus assimilis elegans) are briefly discussed. The Subantarctic Little Shearwater was found dead on Campbell I. on July 6, 1970. This species, the first recorded from Campbell I. and the largest of the three races of the species breeding in the New Zealand region, is known to breed on the Chathams, Antipodes, and Auckland Is. The specimen, an adult male, was forwarded to the Dominion Museum.

B-10426
Gimingham, C.H. , Smith, R.I.L.
GROWTH FORM AND WATER RELATIONS OF MOSSES IN THE MARITIME ANTARCTIC. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.1-21, 17 refs.

Determinations of normal field water content and the approximate proportion held "externally" (e.g. between leaves and stem, among rhizoids, etc.) were made for a number of mosses on Signy I. The effects of colony form (i.e. packing and arrangement of shoots) on water loss in desiccating atmospheres and on water uptake were determined experimentally. Dense growth forms, in particular the cushions (large and small), turves and carpets, are the most prominent.

B-10428
Walton, D.W.H. , Greene, S.W.
SOUTH GEORGIAN SPECIES OF ACAENA AND THEIR PROBABLE HYBRID. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.29-44, 30 refs.

The taxonomy and variability of the species of Acaena occurring on South Georgia have been investigated. The taxon belonging to the A. magellanica group has been referred to Acaena decubens (Gaertn.) D.W.H. Walton comb. nov. and its relationship to other members of the group in South America and various Subantarctic islands has been considered. The validity of treating the second South Georgian taxon, Acaena tenera Alboff, as a distinct species has been verified and its relationship to A. antarctica Hook. f. and A. masafuerana Bitter has been considered. However, A. microcephala Schlect. has been shown to be a synonym of A. antarctica Hook. f. The characters of the two South Georgian species

and of the populations intermediate between them have been defined and the probable hybrid origin of the intermediate plants, referred to A. decumbens tenera, is discussed. (Auth.)

B-10430
Lindsay, D.C.
VEGETATION OF THE SOUTH SHETLAND ISLANDS. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.59-83, 33 refs.

A general account is presented of the vegetation of the South Shetland Is. which comprises seven subformations, six being dominated by cryptogamic plants. The sociations recognized within each subformation are described and variation in their composition is related to environmental and habitat conditions. An algal sociation, of Nostoc, previously recorded only from continental Antarctica, is also described. The absence of large banks of Polytrichum alpinum in comparison with other areas in the maritime Antarctic is noted. The influence of environmental factors on the development of vegetation is discussed and an attempt is made to correlate aspects of plant succession in the coastal areas with factors such as exposure, salt spray and nitrogen supply. (Auth.)

B-10432
Lindsay, D.C. , Brook, D.
LICHENS FROM THE THERON MOUNTAINS. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.95-98, 7 refs.

Ten species are recorded in the first known collection of lichens from the Theron Mountains, and their distribution is noted in connection with various ecological factors. The composition of the flora in relation to other areas of Antarctica is briefly discussed. (Auth.)

B-10433
Lindsay, D.C.
NOTES ON ANTARCTIC LICHENS: IV. LICHENS FROM TOTTAMFJELLA, DRONNING MAUD LAND. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.99-100, 2 refs.

During examination of the numerous lichen collections in the herbarium of the British Antarctic Survey Botanical Section, a number of errors in the identifications of the G.T. Bowra collection from Tottanfjella was noticed. Eighteen taxa were published by Bowra and others (1966; B-4824). A revised list of lichens, with their distribution in Tottanfjella is given showing 13 species.

B-10434
Samsel, G.L., Jr. , Parker, B.C.
COMPARISONS OF TWO ANTARCTIC LAKES WITH DIFFERENT TROPHIC STATES. Virginia journal of science, 1971 22(4), p.177-182, 17 refs.

Primary productivity, physical features and chemical and biological composition of an oligotrophic and an eutrophic lake were studied during Jan. 1970 at Anvers Island, Antarctica. Both lakes, less than 500 m apart had partial ice cover the entire season and were underlain with a similar silica-rich granite. Differences in the amount of chlorophyll and dissolved chemicals found in the lakes during the three week study period are discussed.

B-10441
Feeney, R.E. , Vandenheede, J., Osuga, D.T.
MACROMOLECULES FROM COLD-ADAPTED ANTARCTIC FISHES. Naturwissenschaften, Jan. 1972 59(1), p.22-29, 33 refs.

Studies of the authors and other investigators on blood proteins and muscle and brain enzymes from Antarctic fishes adapted to the -1.85 C temperature of the ice-salt water of McMurdo Sound, Antarctica are reviewed. The blood had two major characteristics related to the cold-adaptation: a rapid rate of clotting of the blood at 0 C and a very specialized type of glycoprotein (antifreeze protein) responsible for the prevention of freezing of the blood. This antifreeze protein has the repeating structure of a glycotripeptide consisting of units of alanine, threonine with each threonine glycosidically linked to a disaccharide of galacyosyl-N-acetyl galactosamine. Six enzymes studied were muscle fructose-1, 6-diphosphate aldolase, glyceraldehyde-3-phosphate dehydrogenase, glycogen phosphorylase, and lactic dehydrogenase, heart mitochondrial cytochrome system, and brain tissue acetylcholinesterase. Adaptations for efficient catalysis at low temperatures included a low activation energy (for catalysis) and a resistance to inactivation at low temperature, but there was no general property characteristic of low temperature adaptation.

B-10446
Litvinov, M.A.
DISTRIBUTION OF THE MICROSCOPIC MYCELIAL MUSHROOMS AND YEAST ORGANISMS IN ATLANTIC WATERS. Rasprostranenie mikroskopicheskikh mitselial'nykh gribov i drozhzhevykh organizmov v vodakh Atlanticheskogo okeana. Kats, A.I., (ed.), Problemy tsirkuliatsii v atmosfere i gidrosfere Atlanticheskogo okeana (Problems of circulation in the atmosphere and hydrosphere of the Atlantic Ocean), Leningrad, Gidrometeoizdat, 1970, p.111-117, In Russian. 18 refs.
QC880.P76

Studies of 349 water samples collected at 21 deepsea stations on the Professor Vize in 1969 within 60 N and 60 S along 30 W from the surface to a depth of 7,000 m show a small percentage in findings of microscopic mycelial mushrooms in the Atlantic Ocean, an extreme variety of the species, very few duplications at different latitudes, and no data on their reproduction in water. The conclusion is drawn that the mushrooms are not marine natives, and must have been airborne to the ocean. Yeast organisms were found at 13 out of 21 stations, only one or two strains at each station. Factors such as distribution at various latitudes and depths, limited variety of forms, and occurrence of gemmation forms testify that the yeasts found in the ocean are true marine organisms.

B-10453
Spellerberg, I.F.
MCMURDO SOUND SKUAS, PETRELS AND PENGUINS. Antarctic, June 1971 6(2), p.53-56

Avifauna recorded at McMurdo Sound and Ross I. includes the Emperor and Adelie penguins, the Antarctic petrel, southern giant petrel, snow petrel, and Wilson's storm petrel, the Dominican or kelp gull, and the McCormick skua. The breeding localities of these species are discussed.

B-10459
SUGGESTED FUTURE WORK BY UNIT AT CAPE BIRD. Antarctic, June 1971 6(2), p.69-70

The University of Canterbury's Antarctic

biological research program included seal research at Scott Base and research on penguins, skuas, and terrestrial invertebrates, initially at Cape Royds, and since the summer of 1966-67, at Cape Bird. The annual count of Adelie penguins at Cape Bird has shown vast fluctuations among numbers returning to breed. There is a need to relate these fluctuations to the physical conditions of the environment, availability of food, and population structure. A biotelemetry program to trace winter and summer movements of penguins is recommended. Studies of the South Polar skua at Cape Bird have shed new light on the social behavior of these birds. Future study of skua behavior relies on the marking of birds of known age and their subsequent recovery and follow up. The tagging of seals has enabled the tracing of seal movements and fidelity from resightings. The development of techniques for determining the age and reproductive condition of live seals would greatly facilitate quantitative work on the population dynamics of the Weddell seal.

B-10481
Beadnell, M.
PENGUINS. Victorian naturalist, Nov. 1971 88(11), p.306-309

There are about eighteen varieties of penguins, ranging from the huge Emperors, standing 48 in. high to the 14 in. Northern Blues. They are among the most highly specialized of fauna and are perfectly adapted to the arduous conditions under which most of them breed. A description is given of the morphological and physiological adptations of penguins to marine life, and their feeding habits, social behavior, nesting activities, and breeding behavior. The two large varieties, Emperors and Kings, do not build a nest but lay a single egg directly onto the ground or the sea-ice. Great recognition ceremonies and nest building activities take place among the Adelies. In Emperors and Adelies the male does all the incubating. Carbon dating of the Adelie colony at Cape Hallett shows an age of over 1,000 yr.

B-10503
Akademiia nauk SSSR. Otdelenie obshchei biologii, Beklemishev, K.V. ed
PRINCIPLES OF THE BIOLOGICAL PRODUCTIVITY OF THE OCEANS AND ITS EXPLOITATION. Osnovy biologisheskci produktivnosti okeana i ee ispol'zovanie. Moskva, Nauka, 1971. 295p.. In Russian. Refs.

This book deals with the ecology, population, and distribution of the biota in the World Ocean, including the Antarctic Ocean. The relationship of living things to biotic factors, such as marine biogenic elements and primary productivity, is discussed. For abstracts of pertinent papers see: B-10504--B-10506

B-10504
Voronina, N.M.
ANNUAL CYCLE OF ANTARCTIC PLANKTON. Godovoi tsikl planktona v Antarktike. Akademiia nauk SSSR. Otdelenie obshchei biologii, Osnovy biologicheskoi produktivnosti okeana i ee ispol'zovanie, 1971, p.64-71, In Russian with English summary. 27 refs.

Data collected by the Ob' and Discovery (Foxton, 1956) were used to determine the effect of seasonal factors on the horizontal distribution of plankton in Antarctic waters. Three latitudinal zones were established and mean monthly values of zooplankton standing crop were calculated. The results show that the seasonal changes of the zooplankton biomass in all zones follow a bimodal curve. It seems that the first peak results from the spring migration of plankton while the second depends on the development of the new generation. The second or summer peak of zooplankton first appears in the northern latitudes and then develops farther to the south, appearing two months later than the phytoplankton bloom over most of the area. The northern zone is characterized by the highest peak and longest period of existence of the biomass. The summer biomass of copepods in boreal zooplankton exceeds that in the Antarctic variety chiefly due to variations in copepod stages during annual cycles. (Auth. mod.)

B-10505
Makarov, R.R. , Shevtsov, V.V.
DISTRIBUTION AND BIOLOGY OF ANTARCTIC KRILL. Nekotorye problemy raspredeleniia i biologii antarkticheskogo krilia. Akademiia nauk SSSR. Otdelenie obshchei biologii, Osnovy biologicheskoi produktivnosti okeana i ee ispol'zovanie, 1971, p.81-88, In Russian with English summary. 30 refs.

Commercial fishing of antarctic macroplankton, Euphausia superba (antarctic krill), greatest masses of which are distributed in the Southern Ocean, is discussed. The conditions of swarming, patching and other biological characteristics of krill which are of significance to fisheries were investigated during 1965-1969 on the Soviet research vessel Akademik Knipovish. The 1 to 2 yr old krill which characteristically swarm separately may be used by commercial fisheries. The quantity of krill in the Southern Ocean is variously estimated as 953 to 1350 million tons. The density of organisms in krill patches reaches 15 kg/cu m. The annual cycles of E. superba undergo significant changes which depend on environmental conditions during each year. (Auth. mod.)

B-10506
Klumov, S.K.
FEEDING OF SPERM WHALES IN THE SOUTHERN HEMISPHERE. O pitanii kashalotov v IUzhnom polusharii. Akademiia nauk SSSR. Otdelenie obshchei biologii, Osnovy biologicheskoi produktivnosti okeana i ee ispol'zovanie, 1971, p.115-136, In Russian with English summary. 90 refs.

An inventory of 22 species of squids and 6 species of bathypelagic fish inhabiting Antarctic waters itemizes and describes the stomach contents of sperm whales taken in the World Ocean. Chiroteuthis veranyi was first discovered in Antarctic waters. Todarodes sagittatus ssp. and Moroteuthis ingens are recorded for the first time from the southern part of the Indian Ocean. M. ingens, M. robsoni, Tetronychoteuthis dussumieri and Histioteuthis bonelli were first found in stomachs of sperm whales in the New Zealand waters. Gnathophausia ingens--bathypelagic mysid--was discovered to be the constant food component of sperm whales in the southern part of the Indian Ocean. The abundant species of bathypelagic squids are the primary feeding of these whales; large schools and individuals of bathypelagic fishes are a secondary supply. (Auth. mod.)

B-10509

Greene, D.M. , Holtom, A.
STUDIES IN COLOBANTHUS QUITENSIS (KUNTH) BARTL. AND DESCHAMPSIA ANTARCTICA DESV.: III. DISTRIBUTION , HABITATS AND PERFORMANCE IN THE ANTARCTIC BOTANICAL ZONE. British Antarctic Survey. Bulletin, Oct. 1971 No.26, p.1-29, 19 refs.
QH84.2.B72

A study of the distribution of Colobanthus quintensis and Deschampsia antarctica within the Antarctic botanical zone has shown that both species are found on the islands of the Scotia Ridge and on island and mainland sites along the west coast of the Antarctic Peninsula to Marguerite Bay. There are fewer localities for C. quitensis than D. antarctica and it is more restricted within a locality, being confined to drier situations at lower altitudes. Habitat differences influence both the vegetative and reproductive performance of D. antarctica. Luxuriant sterile plants are found in moist situations or where there is nitrogeneous enrichment of the substratum, whereas on drier or non-enriched sites plants are stunted but flower profusely. The nitrogenous status of the substratum does not appear to influence C. quitensis in the same way. Viable seed can be set by both species throughout the region but probably not regularly, at least in D. antarctica. Failure is not correlated with latitude or altitude as both species can reproduce successfully at moderate altitudes at their most southernly station. C. quitensis is more frequently successful than D. antarctica. mature seed or seedlings have been produced at 93 percent of localities from which information is available, against 41 percent for the grass. (Auth.)

B-10511
Connor, R.W.M.
STUDIES IN COLOBANTHUS QUITENSIS (KUNTH) BARTL. AND DESCHAMPSIA ANTARCTICA DESV.: IV. DISTRIBUTION AND REPRODUCTIVE PERFORMANCE IN THE ARGENTINE ISLANDS. British Antarctic Survey. Bulletin, Oct. 1971 No.26, p.41-50, 6 refs.
QH84.2.B72

The detailed distribution of Colobanthus quitensis and Deschampsia antarctica in the Argentine Is. was mapped between 1963 and 1965, and revealed that D. antarctica was quite widespread but that C. quitensis was confined to three localities. Flowers and inflorescences were produced at most of the sites but mature seed, although set during 1962-63 and 1964-65, was not formed by either species during 1963-64. Germination tests using different temperature regimes showed that seed produced in 1962-63 was viable. (Auth.)

B-10513
Callaghan, T.V. , Lewis, M.C.
ADAPTATION IN THE REPRODUCTIVE PERFORMANCE OF PHLEUM ALPINUM L. AT A SUB-ANTARCTIC STATION. British Antarctic Survey. Bulletin, Oct. 1971 No. 26, p.59-75, 21 refs.
QH84.2.B72

Investigations were undertaken into phases of the life cycle of Phleum alpinum growing in situ on South Georgia to provide comparison between widely differing micro-environments. The flowering tiller performance showed that the time needed for complete development was similar in differing habitats and that this stabilization of overall performance was achieved by differentiation of contributory processes. Vegetative reproduction proved to be very similar at the various sites but reproduction by inflorescences, as assessed by seed and floret numbers per flowering tiller and per unit ground area, were generally negatively correlated with habitat severity. Comparisons of reproduction by inflorescences at the various sites also indicated the existence of compensatory mechanisms aimed at the stabilization at the various sites. Seed germination trials showed that vernalization treatments were unimportant and that the seeds, although capable of germinating at low temperature, germinated earlier at higher temperatures. Between-site comparisons of tiller dry weights and living biomass gave some assessment of the success of the developmental and reproductive phases in maintaining plant populations under contrasting enviromental conditions; they were found to be negatively correlated with habitat severity and to be generally low in comparison with Arctic and alpine regions. (Auth.)

B-10514
Lindsay, D.C.
NOTES ON ANTARCTIC LICHENS: V. THE GENUS OCHROLECHIA MASSAL. British Antarctic Survey. Bulletin, Oct. 1971 No.26, p.77-79, 6 refs.
QH84.2.B72

Descriptions, new localities and some habitat data are reported for Ochrolechia antarctica (Mull. Arg.) Darb., O. frigida (Sw.) Lynge and O. parella (L) Massal. The second known collection of O. deceptionis (Hue) Darb. is reported from Nelson I., South Shetland Is.

B-10515
Mcdonald, J.W. , Conroy, J.W.H.
VIRUS DISEASE RESEMBLING PUFFINOSIS IN THE GENTOO PENGUIN (PYGOSCELIS PAPUA) ON SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Oct. 1971 No.26, p.80-82, 8 refs.
QH84.2.B72

Excessive mortality of gentoo penguin chicks was recorded at Signy I., South Orkney Is. in Jan. 1969. Multiple ulcers were observed on the feet of almost all live and dead chicks examined and a few live adults. The symptons are similar to those characterizing puffinosis in shearwaters, fulmars and gulls. The nature of the disease was investigated using virological, histological and experimental techniques, and observations are presented which suggest that the black-browed albatross may have been an intermediate host between shearwaters and penguins. (Auth.)

B-10516
Conroy, J.W.H.
WILSON'S PHALAROPE (STEGANOPUS TRICOLOR) IN THE ANTARCTIC. British Antarctic Survey. Bulletin, Oct. 1971 No.26, p.82-83, 12 refs.
QH84.2.B72

The phalaropes (Phalaropidae) are a group of waders which breed in the Northern Hemisphere and migrate to the Southern Hemisphere in the winter. The grey phalarope and the red-necked phalarope have a circum-polar breeding distribution, while Wilson's phalarope breeds only in North America. Wilson's phalarope has previously been seen in the Falkland Is. and probably off Tierra del Fuego. The sighting of one of this species at Fossil Bluff, Alexander I. in Oct. 1968 extends the southern limit of the species by over 20 deg latitude.

B-10534

Warham, J.
BREEDING SEASONS AND SEXUAL DIMORPHISM IN ROCKHOPPER PENGUINS. Auk, Jan. 1972 89(1), p.86-105, 16 refs.
QL671.N9

Comparative data for adult male Rockhopper penguins at Antipodes and Campbell Is. indicated that males were bigger billed and heavier than females, but some females had longer flippers. Males also had significantly longer flippers in the Antipodes birds. Campbell adults were significantly smaller billed than those from Antipodes, and small differences were also noted in the bill color patterns of the two populations. The 56 yearlings measured were smaller billed and shorter in flipper than the adults, but the bills and flippers of yearlings from the two islands were not significantly different. The Campbell yearlings were heavier than those from Antipodes mainly because the Campbell birds included 12 in premolt condition. The data for weight and bill size of 72 Antipodes chicks were bimodal suggesting that sexual dimorphism in these parameters had already become established. The chicks' bills were only 48 percent of the adult size, but the flippers were 96 percent as large as those of the adults. The function of sex differences in Rockhopper penguin measurements is not known, nor is the age at which bill growth ceases. Differences in morphological characters between populations on different islands separated by wide stretches of sea probably reflected genetic isolation enhanced in part by the tendency of young birds to return to their natal islands. The laying season in Rockhopper penguins is correlated with mean annual sea temperature.

B-10535
Weller, M.W. , Kerksen, D.V.
USE OF TIME-LAPSE PHOTOGRAPHY TO STUDY NESTING ACTIVITIES OF BIRDS. Auk, Jan. 1972 89(1), p.196-200, 6 refs.
QL671.N9

The incubation behavior of the Adelie penguin was recorded in 1969-1970 at Hallett Station with 3 times-lapse cameras: a Nikkorex Zoom 8, which averaged intervals of 2.47 min, and 2 Nizo S-80 cameras set for 1 frame per min. A total of 2,100 ft of Super 8 film yielded nearly 151, 200 frames. To provide a continuous record of individuals and sexes birds were marked by spray-painting and banding. In order to determine the degree and direction of error notes were taken for twelve 1/2-hr periods to compare with the film sequences. Of 2,243 events (i.e., position on nest, preening, rock-gathering, etc.) recorded by one observer during this period the camera missed 110 (4.9 percent) but corrected the observer for errors of various types 50 times (2.2 percent). In general, all major events were recorded. Disadvantages of the system are (1) the lengthy processes of analyzing the film for events and (2) the superfluous operation at night when light levels rarely reach the minimum required for photographs.

B-10540
Spellerberg, I.F.
ARRIVAL AND DEPARTURE OF BIRDS AT MCMURDO SOUND, ANTARCTICA. Emu, Oct. 1971 71(4), p.167-171, 23 refs.
QL671.E5

Nine species of birds were recorded at McMurdo Sound, Antarctica, between 1963 and 1966. Of these, two were skuas (Brown, McCormick) and one was a gull (Dominican). The arrival and departure dates are documented where possible, and it appears that the timing of breeding and moult is adjusted to the climate and resources of food at this high latitude. Breeding behavior of some species is synchronized so that there is a shorter breeding period at this latitude than to the north.

B-10568
Arnaud, F.
SUBANTARCTIC PYCNOGONIDA FROM THE CROZET ISLANDS. Pycnogonides subantarctiques des iles Crozet. Paris. Muséum national d'histoire naturelle. Bulletin, 1969 41(6), p.1423-1428, In French with English summary. 10 refs.
QH3.P22

Three species of Pycnogonida are reported from Crozet Is. (Possession I.) tide pools and wrecked kelps: Austrodecus sp., juv., (probably a new species) and Tanystylum cavidorsum stock (with the first description of a male specimen), both newly recorded from this locality; and Pycnogonum platylophum Loman.

B-10569
Moyano G., H.I.
ONE NEW FAMILY, THREE NEW GENERA AND ONE NEW SPECIES FOR ANTARCTICA (BRYOZOA, CHEILOSTOMATA). Una familia, tres generos y una especie nuevos para la Antartica (Bryozoa Cheilostomata). Cahiers de biologie marine, 1970 11(2), p.153-166, In Spanish with English and French summaries. 17 refs.
QH90.C3

Three new genera and one new species are described in the present paper. The genera are the following: Cellarinelloides crassus; Larvapora, type species Cellaria mawsoni Livingstone, 1928 and Trilaminopora type species Microporella trinervis Waters, 1904. Although Larvapora is considered as an intermediate state between Aspidostomatidae and Cellaridae, its great structural similarity to Melicerita, allows its inclusion in the latter family. Trilaminopora is classified in the Harmer's Ascophora Imperfecta owing to its resemblance with genera such as Triporula and Exechonella. The new family Cellarinellidae is formed to group the genera Cellarinella Waters, 1904; Systenopora Waters, 1904 and Cellarinelloides since Sclerodomus, the type genus of Sclerodomidae, was incorporated in Bifaxariidae by Harmer in 1957.

B-10571
Shaughnessy, P.D.
FREQUENCY OF THE WHITE PHASE OF THE SOUTHERN GIANT PETREL MACRONECTES GIGANTEUS (GMELIN). Australian journal of zoology, April 1971 19(1), p.77-83, 24 refs.
QL1.A865

Published data on frequencies of white-phase M. giganteus in breeding colonies and at sea are reviewed and compared with observations made at colonies on Macquarie I. and at 3 locations in Antarctica. The frequency of white birds in the single east-coast colony on Macquarie I. (15.1 percent) was significantly higher than that in west-coast colonies (6.8 percent) while that in Antarctic colonies was very low (0.3 percent). No relationship could be shown between plumage-phase frequency in breeding colonies and either their latitude or their position relative to the Antarctic Convergence. Several suggestions for the control of plumage-phase frequency are made. (Auth.)

B-10572
Ramirez R.,B.
ANALYSIS OF MARINE PLANT PIGMENTS IN A TRANSECT OF THE SOUTH PACIFIC. Análisis de pigmentos vegetales marinos en un corte meridiano del Pacífico sur. Investigación pesquera, Oct. 1970 34(2), p.309-318. In Spanish with English summary. 17 refs.
SH285.I6

The location of the Antarctic Convergence is confirmed, using phytoplankton pigments as a biological indicator. Chlorophylls a, b, y, and c were analyzed as suggested by Creitz and Richards (1955), according to the method of Richards and Thompson (1952) for the characterization of plankton populations by pigment composition. Populations in the Convergence can be considered less mature in relation to the rest of the ecosystem, where an amplification of the flow of energy occurs as the surface waters incorporate a large quantity of nutrients. (Auth.)

B-10576
Bryden, M.M.
SIZE AND GROWTH OF VISCERA IN THE SOUTHERN ELEPHANT SEAL, MIROUNGA LEONINA (L). Australian journal of zoology, July 1971 19(2), p.103-120, 43 refs.
QL1.A8E5

Relative size and relative growth of the viscera of elephant seals ranging in age from birth to 16 yr were studied. Fat-free body weight was the independent variable in the analyses. Changes of relative weight of some organs were particularly marked in phase I of growth (suckling phase), when very rapid body weight growth occurred. The relative size of most organs was similar to that in other mammals. The stomach was relatively smaller than other carnivore stomachs, and the liver was relatively larger than in terrestrial mammals but similar to that in cetaceans. The relative length and weight of the small intestine were very much greater than in other carnivores. The spleen was relatively very large. The possible reasons for the difference in relative size of these organs in elephant seals and other mammals are discussed. Growth gradients of most organs did not alter significantly between or within growth phases. Exceptions to this pattern were noted and illustrated for the stomach, liver, pancreas, heart, reproductive tract, and eyes. The interpretation of the growth patterns of different organs was that changes in growth gradients occurred in those organs whose functional significance changed during postnatal life. The functional significance of most organs did not alter markedly within or between growth phases, and in those organs no change in growth pattern occurred throughout postnatal life. (Auth.)

B-10580
Ommanney, F.D.
LOST LEVIATHAN. London, Hutchinson, 1971, 280p.
QL737.C4044

The author surveys the known facts about the whale and its future as a species, and gives personal reminiscences of the whalers and whaling stations of the Antarctic during his service with the Discovery team, which went to the Antarctic to investigate the biology of whales and the effect of whaling on the stock of whales. An account is given of whales, dolphins and porpoises, the produce of whales, and the history of whaling. The author's experiences at a whaling station are followed by a detailed description of the Rorqual, its chase, the sizes and ages of Rorquals, and life on board a factory ship. A discussion on krill, a small crustacean which is the sole food of Whalebone whales in the Antarctic, is followed by chapters on the Sperm whale which feeds on squids, and on the Humpback and Sei whales, which have increased in commercial importance in recent times. The final chapter deals with population dynamics and the stocks of whales.

B-10581
Small, G.L.
THE BLUE WHALE. New York, Columbia University Press, 1971, 248p., Refs.
QL737.C424S58

This book provides a case history in the exploitation of the blue whale, detailing research into the conditions affecting the species. An introductory chapter describes the history of the whaling industry and the subsequent near extinction of the blue whale. The following chapters discuss the tragedy in the entirety, concentrating on whaling activities in the Southern Hemisphere, particularly the Antarctic since about 97 percent of all blue whales killed met death in the Antarctic. The 2nd chapter details the biology of the blue whale including taxonomy, physiology, reproduction and maturation. Subsequent chapters discuss the decimation and population decline of the species including chapters on Antarctic pelagic whaling, industrial economics, national whaling policies and international whaling control. The book provides a natural history of this whale and a germane case study and is fully illustrated with photographs, tables and charts. An extensive bibliography is provided, and an index as to subject concludes this account. (Biol. Abstr.)

B-10584
Martin, P.G.
DARWIN RISE HYPOTHESIS OF THE BIOGEOGRAPHICAL DISPERSAL OF MARSUPIALS. Nature, Jan.10,1970 225(5228), p.197-198, 19 refs.
Q1N2

Evidence is presented to support the present distribution of marsupials in Australia and South America (with some immigration into North America late in the Tertiary). It is concluded that marsupials could not have entered Australia from either Asia or Antarctica. Dispersal from South America via Antarctica appears unlikely because (1) the marsupials were not accompanied by placentals, and (2) Australia and East Antarctica only separated 40 m.y. ago and the distances are such that it seems improbable that West Antarctica could have formed a bridge between South America and East Antarctica until after this separation. A theory of marsupial dispersal is proposed which suggests that marsupials evolved on a land mass situated over the Darwin Rise. One fragment drifted southwest to form the Coral Sea Zone with which Australia came into contact during its drift north in the Oligocene, and the other drifted northeast to form part of present North America from which the marsupials eventually spread to South America.

B-10587
Cox, C.B.
MIGRATING MARSUPIALS AND DRIFTING CONTINENTS. Nature, May 23, 1970 226(5247), p.767-770, 12 refs.
Q1.N2

It is suggested that Martin's theory of the biogeographical dispersal of marsupials (B-10584) is at variance with the bulk of the present

picture of continental movements and directions of sea-floor spreading, and other theories are adequate. The problem peculiar to Australia is the presence there of marsupials but not of placentals. It has been assumed that both groups appeared at approximately the same time and that an easy route of access to Australia would have been traversed by both groups. Consideration of the evidence leads the present author to concur with Martin that marsupials did not reach Australia from Asia. It is suggested, however, that marsupials were in existence before the placentals, which may have evolved from them later. It is also possible that the marsupials migrated from Africa to Australia via Antarctica before the Antarctica-Australia land mass separated from Africa and that this in turn took place before the placentals reached Antarctica-Australia.

B-10588
Jardine, N. , McKenzie, D.
CONTINENTAL DRIFT AND THE DISPERSAL AND EVOLUTION OF ORGANISMS. Nature, Jan.7,1972 235(5332), p.20-24, 53 refs.
Q1.N2

Plate tectonics is used to investigate the evolution and dispersal of organisms, mainly the marsupials. The hypothesis that the South American marsupials are derived from the marsupial immigrants from North America is indirectly supported by evidence for the derivation of the other old elements of the South American fauna from North American immigrants. The hypothesis that all Australian marsupials are derived from immigrants from South America by way of Antarctica is based on more conclusive evidence. From the Albian/Aptian (about -106 Ma) when Africa separated from South America and Antarctica to -43 Ma (when Australia separated from Antarctica) this was the only available overland source for Australian marsupials. Cox's hypothesis (B-10587) that marsupials reached Australia from Africa through Antarctica is ruled out by the early separation of Africa. Colonization of Antarctica by mammals during the late Cretaceous or early Tertiary is ecologically plausible, since Antarctica was probably not glaciated during this period. The facts suggest that all the Australian marsupials originated from a single didelphoid stock which colonized Australia before its separation 43 Ma ago. It is speculated that the unspecialized didelphoid marsupials were able to colonize Antarctica, and that the specialized placentals could not.

B-10593
Kohlmeyer, J.
MARINE FUNGI DETERIORATING CHITIN OF HYDROZOA AND KERATIN-LIKE ANNELID TUBES. Marine biology, Feb. 1972 12(4), p.277-284, 22 refs.
QH91.A1.M35

Higher marine fungi were found for the first time as degraders of chitinous exoskeletons of hydrozoa and of keratinous (?) tubes of annelids. Collections were made in several locations of the Atlantic and Pacific Oceans. Fruiting bodies and hyphae of the ascomycete Abyssomyces hydrozoicus Kohlm. occurred on hydrozoa at a depth of 631 to 641 m near the South Orkney Is. Sterile mycelia, some of them resembling Dictyonema zoophytarum Reinsch, were collected on hydrozoa on the North Carolina coast, and offshore at a depth of 46 to 73 m. Tubes of the polychaete Chaetopterus variopedatus (Renier) washed ashore in California contained ascocarps and mycelia of Lulworthia sp. Hyphal growth on and in the animal tubes is described and illustrated. (Auth.)

B-10594
Mayr, E.
CONTINENTAL DRIFT AND THE HISTORY OF THE AUSTRALIAN BIRD FAUNA. Emu, Jan. 1972 72(1), p.26-28, 12 refs.
QL671.W5

Earlier papers suggested that the vast majority of birds colonizing Australia arrived by island-hopping via Indonesia. The present communication considers the bird taxa that might have reached Australia by another route. Possibly some of the Australian bird fauna are old enough to be remnants of the Gondwanaland fauna that predates the break-up of the old Gondwana continent, or others might have reached Australia by jumping moderate water-gaps. The bird fauna discussed include the Ratites, the Forpus (Amoropsittaca) group of South America parrots, the Suboscine families of the Australian region, and the flamingos (Phoenicopteridae). These older elements of the present Australian bird fauna might have reached Australia via Africa and Antarctica during the earlier stages of the Gondwanaland fragmentation; however, the evidence for an old Gondwana element in the bird fauna of Australia is slight.

B-10595
Monniot, F.
ASCIDIACEA APLOUSOBRANCHIA OF THE KERGUELEN ISLANDS COLLECTION BY P. GRUA. Ascidies aplousobranches des Îles Kerguelen récoltées par P. Grua. Paris. Muséum national d'histoire naturelle. Bulletin, 1970 42(2), p.321-339, In French. 18 refs.
QH3.P22

The P. Grua collection of Ascidiacea Aplousobranchia from the Kerguelen Is. is described and includes: (1) Polyclinidae, of which the genus Aplidium is diversified (9 species), Aplidiopsis and Synoicum genera; (2) Didemnidae, represented by only one genus, Didemnum studeri Hartmeyer, 1911; and (3) Clavelinidae by Sycozoa, Distaplia, and Hypsistozoa genera.

B-10596
Monniot, C.
ASCIDIACEA PHLEBOBRANCHIATA AND STOLIDOBRANCHIATA OF THE KERGUELEN ISLANDS COLLECTION BY P. GRUA. Ascidies Phlébobranches des Îles Kerguelen récoltées par P. Grua. Paris. Muséum national d'histoire naturelle. Bulletin, 1970 42(2), p.340-354, In French. 19 refs.
QH3.P22

The collection includes 8 species, 2 of which are newly reported, Polyzoa minor and Molgula bancalis; 2 others new to Kerguelen, Agnesia glacialis and Ascidia incrassata; Polyzoa opuntia; Oligocarpa megalorchis; Styela sp., aff. wandeli; and Chemidocarpa verrucosa. Systematic and comparative descriptions are given.

B-10597
Badonnel, A.
ANTARCTOPSOCUS DAVIESI, NEW SPECIES OF THE CROZET ISLANDS (PSOCOPTERA, ELIPSOCIDAE). Antarctopsocus daviesi, nouvelle espèce des Îles Crozet (Psocoptera, Elipsocidae). Paris. Muséum national d'histoire naturelle. Bulletin, 1970 42(2), p.355-362, In French. 3 refs.
QH3.P22

The new species Antarctopsocus daviesi

reported from the Crozet Is. is described and compared with A. jeanneli Badonnel, 1947 which was first found in 1939 on Marion I.

B-10603
McSweeny, E.S.
DESCRIPTION OF THE JUVENILE FORM OF THE ANTARCTIC SQUID MESONYCHOTEUTHIS HAMILTONI ROBSON.
Malacologia, Dec. 1970 10(2), p.[illegible], 5 refs.

The juvenile form of Mesonychoteuthis hamiltoni Robson is fully described and figured from 4 specimens captured by the U.S. Naval Ship Eltanin in Antarctic waters. Measurements and indices are given. This constitutes the first full description of the species. The validity of the genus is reaffirmed, but relationships to other genera within the family Cranchiidae are not yet clear. (Auth.)

B-10604
McQuillan, H.
ANTARCTIC KRILL. Western fisheries, Jan. 1962 63(4), p.20, 3 refs.
SH1.W4

Commercial fishing of the Antarctic krill as a source of food in the future is briefly discussed. Euphausia superba abound in an area around Antarctica of about 3,500,000 sq mi and to a depth of about 30 ft to as high as 1,000 lbs per acre. They swarm in shoals and windrows from a few yards in diameter to 0.5 acre in size. A pound of krill will yield at least 460 cal or about the same as other shellfish.

B-10607
Mejia, R.H. , Pinto, J.E.B.
BODY FLUID DISTRIBUTION IN THE PAPUA PENGUIN. Distribución del agua en el pingüino Papúa. Instituto Antártico Argentino. Contribución, 1970 No.127. 10p., In Spanish with English, French, German, and Italian summaries. 11 refs.

Research on 31 Papua Penguins carried out at Almirante Brown Station from Jan. to Feb. 1968 included measurement of the volume distribution of the following: (a) homologous erythrocytes marked with Cr51, b) serum albumin marked with Cr51, and (c) radioactive sodium chloride (Na22). It is evident that the Papua Penguin shows a blood volume higher than that of domestic birds and white rats, and that such increase is due to an augmentation in the volume of red cells, since there are no differences of plasmatic volume among those species.

B-10609
Boltovskoy, E.
MARINE BIOLOGY IN ARGENTINA. South African journal of science, Nov. 1971 67(11), p.503-511

South Africa and Argentina possess sectors in the Antarctic and, although each country has followed its own path in scientific development, they have several common marine biological problems. The main aim of the article is to inform South African colleagues about the situation in marine biology in Argentina and be the first step in scientific cooperation and mutual help. The following topics are discussed: short history of oceanographic studies, staff and institutions, Antarctica stations, oceanographic ships, general review of studies in marine biology in Argentina; publications, participation in international oceanographic projects, training of marine biologists, main difficulties and plans for the near future, and probable field of scientific cooperation and mutual help.

B-10610
Bunt, J.S.
LEVELS OF DISSOLVED OXYGEN AND CARBON FIXATION BY MARINE MICROALGAE. Limnology and oceanography, May 1971 16(3), p.564-566, 8 refs.

Seven species of marine microalgae including chlorophytes, diatoms, and a chrysomonad, of tropical, Antarctic, and temperate origin, were used to measure photosyntnetic carbon fixation as affected by concentration of dissolved O2 at two levels of CO2. An apparent O2 inhibition of carbon fixation was observed in some species, but others were affected little or not at all by concentration of dissolved O2. In several cases, O2 appeared necessary for maximal carbon fixation.

B-10614
Bryden, M.M. , Lim, G.H.K.
BLOOD PARAMETERS OF THE SOUTHERN ELEPHANT SEAL (MIROUNGA LEONINA, LINN.) IN RELATION TO DIVING. Comparative biochemistry and physiology, Jan. 1969 28(1), p.139-148, 29 refs.

Certain properties of the blood of southern elephant seals were studied at Macquarie I. in order to determine alterations which may be associated with the ability of this species to remain submerged for long periods. Blood volume increased from 11 percent body weight in newborn seal pups to 15 percent in adults. Hemoglobin concentration was the same as that of man, despite a lower red cell count, due to a greater mean corpuscular volume in the seal. Hematocrit was about 50 in newborn seals and 65 in adults. Changes in blood volume, red cell count, and hematocrit occurred as the young seal went to sea. (Auth. mod.)

B-10643
Boerema, L.K. , Gulland, J.A.
WHALE CONSERVATION. Nature, March 1972 236(5342), p.127

Comments are made on statements in Nature (233, 79; 1971 and 232, 80; 1971 (See: A-9649)) that the direct effects of too intensive killing have been the major cause of observed declines in species of birds, whales, and fish, and on suggestions to increase studies of those direct effects. Resulting from the considerable work and progress made by international agencies, the quotas now set by the International Whaling Commission (IWC) are a fraction of previously established catch limits and according to some scientists are below the sustainable yield of the stocks. It is not true that at least two species of whale have been made extinct in the Antarctic, or anywhere in the world, since the Atlantic grey whale was exterminated many centuries ago. The fin whale is the only species of which the present stock size is far below the level giving the maximum sustainable yield. The present Antarctic quotas are above some estimates of the current sustainable yield, though the excess is small, and if these estimates are correct the quotas would lead to only a slow further decline on the stocks. The member countries of the IWC are still failing to implement the international observer scheme, and little or nothing is being done to rebuild the Antarctic fin whale stocks to a level where they can provide a high sustained yield. Problems have arisen from whaling carried out by non-member countries over which the IWC has no authority. Some action needs to be taken to cope with this kind of problem.

B-10655
Bryden, M.M.
GROWTH OF THE SOUTHERN ELEPHANT SEAL, MIROUNGA LECNINA (LINN.). Growth, March 1969 33(1). p.69-82, 17 refs.
QH511.A1G7

Observations on the growth in length and weight of fetal and postnatal elephant seals (Mirounga lecnina, Linn.) have revealed a normal sigmoid curve. The curves for males and females are different after puberty is reached, and the adult male is about eight times as heavy as the adult female. Very highly significant correlations with body weight have been demonstrated for length and girth, but the former has more practical value because it is easier to obtain in the field. Prediction equations for determining weight from girth or length measurements are presented. Seasonal changes of condition of adult female seals are illustrated, associated with an increase in body weight during winter, and a marked loss of weight during the breeding season and molting. The relationship between sexual disparity in size and polygyny, and whether copulation occurs in or out of the water are discussed. (Auth.)

B-10656
Burt, W.H. ed
ANTARCTIC PINNIPEDIA. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18. 226p., Refs.
QL737.P6A54

Antarctic Pinnipedia reflects some of the more recent contributions on this subject by U.S., Australian, and New Zealand scientists. The 12 papers in this volume (abstracted separately as B-10657 to B-10668) cover a wide range of research on pinnipeds, including a systematics study, a historical review, anatomical research, a population report, behavioral studies, and histological investigations. Concluding the volume are three papers on the survival of histological structure and biochemical constituents in an ancient mummified seal.

B-10657
Hubbs, C.L. , Norris, K.S.
ORIGINAL TEEMING ABUNDANCE, SUPPOSED EXTINCTION, AND SURVIVAL OF THE JUAN FERNANDEZ FUR SEAL. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.35-52, 38 refs.
QL737.P6A54

The Juan Fernandez fur seal, Arctocephalus philippii, occurred in teeming abundance during the sixteenth and seventeenth centuries on the oceanic islands comprising the Juan Fernandez and San Felix groups far off the mainland coast of Chile. Early accounts indicate that several million seals were slaghtered on these islands, and by 1824 the species was indicated as approaching commercial extinction. Recent explorations however, have verified the survival of the species. Arctocephalus philippii has apparently been restricted to the Juan Fernandez and San Felix groups, where it replaces the South American coastal species, A. australis, and is the only extant pinniped (the southern elephant seal, Mirounga leonina, was exterminated early on these islands). (Auth. mod.)

B-10658
Repenning, C.A. , Peterson, R.S., Hubbs, C.L.
CONTRIBUTION TO THE SYSTEMATICS OF THE SOUTHERN FUR SEALS, WITH PARTICULAR REFERENCE TO THE JUAN FERNANDEZ AND GUADALUPE SPECIES. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.1-34, 60 refs.
QL737.P6A54

Fur seals are comprised of two genera: Callorhinus of the northern hemisphere and Arctocephalus, chiefly of the far south. A revision of the genus Arctocephalus is represented, bringing the systematics of the southern fur seals up to date. Eight extant species and one subspecies are recognized, based largely on features of the skull and dentition. Included are A. gazella (Kerguelen fur seal) of the oceanic islands within, and south of the Antarctic Convergence, and A. tropicalis (Amsterdam Island fur seal) of the islands north of the Antarctic Convergence.

B-10659
Pierard, J.
OSTEOLOGY AND MYOLOGY OF THE WEDDELL SEAL LEPTONYCHOTES WEDDELLI (LESSON, 1826). American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.53-108, 37 refs.
QL737.P6A54

A detailed account of the osteology and myology of the Weddell seal (Leptonychotes weddelli) is given. From both osteological and myological standpoints, the close relationship between Leptonychotes and other phocids is obviously confirmed. If compared with Phoca, this seal shows interesting adaptive modifications: a shortened cervical vertebral segment, a musculo-aponeurotic mechanism acting on the trachea and the esophagus, and limbs better adapted for propulsion. (Auth.)

B-10660
Bryden, M.M.
MYOLOGY OF THE SOUTHERN ELEPHANT SEAL MIROUNGA LEONINA (L.). American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.109-140, 12 refs.
QL737.P6A54

The myology of the southern elephant seal is described in detail, and variations that were found during the dissection of a large number of individuals are noted. Comparison is made with the mycology of certain other pinnipeds, and differences in the musculature that are peculiar to Mirounga lecnina are discussed in relation to their probable functional importance. (Auth.)

B-10661
Stirling, I.
POPULATION DYNAMICS OF THE WEDDELL SEAL LEPTONYCHOTES WEDDELLI IN MCMURDO SOUND, ANTARCTICA, 1966-1968. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.141-161, 62 refs.
QL737.P6A54

This paper presents data on the population parameters of the Weddell seal Leptonychotes weddelli in McMurdo Sound from 1966 to 1968, compares them with other pinnipeds, and discusses factors important in the natural regulation of their numbers. For the study 2854 Weddell seals were individually tagged. Subadults were separable on the basis of size alone up to 3 years of age. At least 50 seals were nonselectively shot in February 1966, 1967, and 1968, and data on age structure and pregnancy

rates were obtained. It is indicated that intrasexual competition is taking place in McMurdo Sound and is affecting the reproductive rate. Density-dependent factors come into play when more seals are competing for the best pupping habitat than there is space available. Under such circumstances, social stress may retard reproduction. Dental wear may be an important ultimate cause of adult mortality.

B-10662
Schevill, W.E. , Watkins, W.A.
DIRECTIONALITY OF THE SOUND BEAM IN LEPTONYCHOTES WEDDELLI (MAMMALIA: PINNIPEDIA). American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.163-168, 17 refs.
QL737.P6A54

A 290-meter vertical array of 3 hydrophones was used under the ice of McMurdo Sound, Ross Sea, to determine the depth and distance at which submerged seals Leptonychotes weddelli were calling. Certain acoustic anomalies in the sound received indicate a marked forward and downward sound projection pattern for these seals. (Auth.)

B-10663
Norris, K.S. , Watkins, W.A.
UNDERWATER SOUNDS OF ARCTOCEPHALUS PHILIPPII, THE JUAN FERNANDEZ FUR SEAL. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.169-171, 4 refs.
QL737.P6A54

Sounds heard from Arctocephalus philippii, the Juan Fernandez fur seal, at Isla Robinson Crusoe included moans and snarls in air, and sterotyped low-frequency pulse series under water. Analyses of the underwater sounds shows that the individual pulses started at 150 to 200 Hz and swept downward in frequency 5 to 50 Hz. The series were composed of 17 to 43 pulses and were produced at a rate of about 3 per sec. (Auth.)

B-10664
Siniff, D.B. , Tester, J.R., Kuechle, V.B.
SOME OBSERVATIONS ON THE ACTIVITY PATTERNS OF WEDDELL SEALS AS RECORDED BY TELEMETRY. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.173-180, 13 refs.
QL737.P6A54

Activity patterns of adult female Weddell seals were monitored with telemetry instrumentation. A small continuous-signal transmitter that broadcast at about 53 MHz was sewn to the upper back of the seals. The signal was received and then recorded on a multichannel event recorder. Twenty-four-hour "haulout" and "duration of dive" patterns were obtained for 6 adult females accompanied with pups and 1 barren female. These seals were most active in the water between midnight and 0900-1000 local time. The influence of age of pup and weather on the activity pattern is discussed. (Auth.)

B-10665
Seal, U.S. , Erickson, A.W., Siniff, D.B., Cline, D.R.
BLOOD CHEMISTRY AND PROTEIN POLYMORPHISMS IN THREE SPECIES OF ANTARCTIC SEALS (LOBODON CARCINOPHAGUS, LEPTONYCHOTES WEDDELLI, AND MIROUNGA LEONINA). American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.181-192, 38 refs.
QL737.P6A54

Blood samples were collected from 37 crabeater seals (Lobodon carcinophagus) from 13 Weddell seals (Leptonychotes weddelli) and from 5 elephant seals (Mirounga leonina). Routine blood chemistries were performed, including blood urea nitrogen, uric acid, creatinine, glucose, cholesterol, hemoglobin, protein-bound iodide, and serum iron. The results were analyzed in terms of species, age, sex, and possible pathology. Blood proteins were measured by paper and cellulose acetate electrophoresis and by specific analysis for beta-glucuronidase, ceruloplasmin, haptoglobin, transferrin, corticosteroid-binding globulin, and thyroxine-binding globulin. Serums from each species were compared by ultracentrifugal analysis. Measurements of serum protein-bound carbohydrates were also performed. Hemoglobins and serum proteins were compared by polyacrylamide electrophoresis. Two major hemoglobins were found in each species, one of the same mobility in each species. No hemoglobin polymorphisms were found. Haptoglobin was absent in many specimens. Transferrin polymorphism was demonstrated in the Lobodon samples.

B-10666
Marini, M.A. , Blair, T.T.
SURVIVAL OF HISTOLOGICAL STRUCTURE AND BIOCHEMICAL CONSTITUENTS IN AN ANCIENT MUMMIFIED WEDDELL SEAL. PART I. GENERAL DESCRIPTION AND AGE OF ANTARCTIC SEAL MUMMIES. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.193-196, 5 refs.
QL737.P6A54

Radiocarbon dating of a number of mummified seal carcasses found in the Taylor Valley in Antarctica indicates that the seals had wandered into the valley randomly. The oldest mummy had apparently died about 500-600 A.D. This specimen was reasonably well preserved except for the weathering effects on the exposed side. Weathering had also caused the loss of all the internal organs except the liver and brain. Samples of the tough, dehydrated tissues were subjected to chemical and histological examination.

B-10667
Orr, M.F.
SURVIVAL OF HISTOLOGICAL STRUCTURE AND BIOCHEMICAL CONSTITUENTS IN AN ANCIENT MUMMIFIED WEDDELL SEAL. PART II. SURVIVAL OF HISTOLOGICAL STRUCTURE. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.197-206, 9 refs.
QL737.P6A54

The skins of an ancient Weddell seal (radiocarbon dated as approx 1400 yr old) and of a more recent crabeater seal (200-500 yr old) from the Antarctic have been shown to be similar in structure. In the dermis of each seal was a closed tubular system filled with yellow material that stained only with Sudan black B; this indicates the presence of a high concentration of phospholipids. The tubular system was much more elaborate and extensive in the Weddell seal than in the crabeater. The history suggests that the tissue just beneath the dermis was probably designed for a special function. This layer merged into another layer that was mostly spongy (adipose) tissue; the material filling the spaces in this tissue was similar to the material observed filling the tubules. There were

definite indications that the spongy tissue was an integral part of the tubular system. (Auth. mod.)

B-10668
Hsu, L.H. , Coe, E.L.
SURVIVAL OF HISTOLOGICAL STRUCTURE AND BIOCHEMICAL CONSTITUENTS IN AN ANCIENT MUMMIFIED WEDDELL SEAL. PART III. SURVIVAL OF BIOCHEMICAL CONSTITUENTS. American Geophysical Union. Antarctic research series, Dec. 1971 Vol. 18, William Henry Burt (ed.), Antarctic Pinnipedia, p.207-226, 34 refs.
QL737.P6A54

The biochemical constituents in the skin and liver of a recently dead frozen (for 2 or more yr) baby Weddell seal were compared with the constituents in corresponding organs of a mummified young Weddell seal found in the Taylor Valley and radio-carbon-dated as being about 1400 yrs old. Of the usual tissue constituents examined, the neutral lipids appeared to have survived the best; the cholesterol and triglyceride contents of the ancient liver were 50-100 percent of the content in the recent liver. Phospholipids were somewhat less stable, amounting to 10-23 percent. The polypeptide fraction of ancient seal liver contained about 10 percent of the equivalent recent liver fraction. Attempts to detect RNA were unsuccessful. Uronic acid determination gave values of less than 1 percent. The presence of triose phosphate isomerase and catalase were demonstrated in the ancient liver at respective levels of 0.005 percent and 0.03 percent of the activity in the recent liver.

B-10683
Zasosov, A.V.
MODERN METHODS FOR CALCULATING THE WHALE POPULATION. Sovremennye metody opredeleniia chislennosti kitov. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1969 No. 67, p.201-218, In Russian. 5 refs.

A noticeable decrease in Antarctic fin whale stocks calls for new methods to estimate population and maximum catch quotas. Several methods used to evaluate whale stocks are discussed. The calculation made by a committee of three scientists of the International Whaling Commission, a group of Japanese scientists, and the author shows that fin whales in Antarctic waters decreased to 25 percent of the population in recent years. The results of studies indicate, that the optimum catch level and hence, of industrial mortality of Antarctic fin whales should not exceed 10 percent of the whole population.

B-10692
Grua, P. , Gaillard, J.M., Borojevic, R., Stock, J.H., Redier, L.
INVERTEBRATES OF THE ROCKY INFRALITTORAL OF THE KERGUELEN ARCHIPELAGO. Invertebrés de l'infralittoral rocheux dans l'Archipel de Kerguelen. Comité national français des recherches antarctiques. CNFRA, 1971 No.30, 129p.
QE350.C62

An aqualung project in the Morbihan Gulf during the austral summer of 1962-63 obtained information on the rocky infralittoral conditions of the local waters, the zonation patterns of the algal vegetation, zoological species related to local conditions, and measurements of the biota. Five papers cover the study as follows: Introduction to the ecology by P. Grua; Hydrozoa and Bryozoa by L. Redier; Mollusca by J.M. Gaillard; Calcareous sponges by R. Borojevic; and Pycnogonida by J.H. Stock.

B-10695
Hargens, A.R.
FREEZING RESISTANCE IN POLAR FISHES. Science, April 1972 176(4031), p.184-186, 11 refs.

Arctic and Antarctic fishes, living in contact with sea ice at -1.9 C, have plasma equilibrium freezing points near -1.2 C which are dependent on salt concentrations. These supercooled fishes have plasma protein concentrations much higher than other polar animals have, and the proteins impede ice propagation at temperatures down to -2 C. Plasma protein concentration increases as environmental water temperature decreases. (Auth.)

B-10698
Maclean, G.L.
CLUTCH SIZE AND EVOLUTION IN THE CHARADRII. Auk, April 1972 89(2), p.299-324, Numerous refs.
QL671.N9

Data on variations in clutch size among 205 species of Charadrii are discussed from a phylogenetic viewpoint rather than one of adaptive significance. The geographical distributions and species within the suborder include Chionis alba of the South Orkney Is., and C. minor of Kerguelen I., both species belonging to the family Chionididae, and Gallinago stricklandii of Tierra del Fuego, of the family Scolopacidae. The data indicate that the ancestral clutch size of the Charadrii is 4 eggs. Taxa within the Charadrii that lay fewer than 4 eggs per clutch are younger in evolutionary terms than taxa whose members lay 4-egg clutches, even if these members do so only in that taxon's ancestral range. Both of the Subantarctic species lay 2 or 3 eggs per clutch although C. alba sometimes lay 4. G. stricklandii lays 2 eggs per clutch.

B-10705
Llano, G.A. ed., Wallen, I.E. ed.
BIOLOGY OF THE ANTARCTIC SEAS IV. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, 362p.

This volume of the Antarctic Research Series is the fourth dealing with the biology of the Antarctic seas. Of 13 papers in the volume comprising the results of original investigations, eleven are concerned mainly with the identification and distribution of marine plants and animals. Other papers underscore the importance of zooplankton as a dynamic ecological unit and feature biomass estimates and detailed studies of morphological variations of diatom species made possible by the use of scanning electron microscope techniques. For abstracts of the papers see: B-10706 - B-10718.

B-10706
Springer, S.
THREE SPECIES OF SKATES (RAJIDAE) FROM THE CONTINENTAL WATERS OF ANTARCTICA. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.1-10, 20 refs.

Three recently collected skates (Rajidae) represent all three elasmobranch species now known from Antarctic continental waters. One specimen Raja georgiana Norman, 1938, taken

from a depth of 1232 meters in the northern part of the Ross Sea, provides the southernmost record for an elasmobranch. The other two specimens, assigned to Bathyraia Ishiyama, 1958, on the basis of rostral and clasper characters, were taken near the continental shelf edge of the Antarctic Peninsula. One of them, Bathyraja griseocauda Norman, 1937), has been reported earlier from the Antarctic Peninsula area. The other specimen is described as a new species, Bathyraja maccaini. (Auth.)

B-10707
Kott, P.
ANTARCTIC ASCIDIACEA II. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.11-82, 79 refs.

An account is given of the ascidians collected by the USNS Eltanin since 1965, together with some earlier collections not previously reported on. Of eighty species recorded 65 taken south of 40 S, Aplidium pellucidum and Molgula millari are new to science. Polyclinum sluiteri, Theodorella arenosa, Styele bythia, and Styela bathyphila are recorded from the area for the first time. Alloeocarpa incrustans, Alloeocarpa bridgesi, Cnemidocarpa ohlini, Bathyoncus enderbyanus, Bathyoncus mirabilis, Polycitor magalhaensis, and Aplidium stanleyi, all rare species not previously in the American collections, are present in the new material. The total of 125 species previously recorded from the Antarctic (Kott, 1969: see B-7000) is consequently decreased by synonymy in 2 species, although 4 new records and 2 new species increase the number of antarctic ascidians now recorded to 129. Relationships between many of the species are clarified, and their geographical and vertical ranges are discussed. Exceptions to previously recorded values concern the depth range of certain antarctic species (Tylobranchion speciosum, Didemnum biglans, D. studeri, and Polysyncraton chondrilla) that are now known to extend into deeper water. This confirms and strenghtens hypotheses concerning zoogeography and the origin and spread of antarctic ascidian fauna set forth by Kott, 1969 in Antarctic Ascidiacea (See B-7000).

B-10708
Markham, J.C.
SPECIES OF CEPHALODISCUS COLLECTED DURING OPERATION DEEP FREEZE, 1956-1959. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.83-110, 45 refs.

The specimens of Cephalodiscus M'Intosh collected for the Smithsonian Institution in Antarctic waters during Operation Deep Freeze in 1956-1959 belong to five previously described species C. nigrescens, C. solidus, C. densus, C. fumosus, and C. hodgsoni. The geographical ranges of three of these species are extended, and the bathymetric range of the genus is extended to 1554 meters. The variation of C. fumosus, recorded for the second time, is discussed. (Auth. mod.)

B-10709
McCain, J.C. , Gray, W.S., Jr.
ANTARCTIC AND SUBANTARCTIC CAPRELLIDAE (CRUSTACEA: AMPHIPODA). American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.111-139, 44 refs.

The known species of the Caprellidae from the Antarctic and sub-Antarctic regions are reviewed, six species are described as new, and geographic and vertical distribution records are added to expand the known caprellid fauna of the regions to 21 species. Data on the distribution of Caprellidae compares biogeographical provinces as proposed by Knox and McCain. Nine species are added to McCain's list of 18 caprellids occurring below 400 m. Of these the bathymetric range of Aeginoides gaussi increases directly with the distance from the Antarctic continent, and it is found at greater depths to the N.

B-10710
Heron, G.A. , Bowman, T.E.
POSTNAUPLIAR DEVELOPMENTAL STAGES OF THE COPEPOD CRUSTACEANS CLAUSOCALANUS LATICEPS, C. BREVIPES, AND CTENOCALANUS CITER (CALANOIDA: PSEUDOCALANIDAE). American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.141-165, 11 refs.

A new species of Ctenocalanus, C. citer, is established. Its 6 copepodid stages and the 6 copepodid stages of Clausocalanus laticeps and C. brevipes are described from specimens collected in the Pacific sector of the Antarctic and sub-Antarctic regions by the USNS Eltanin during cruises 15 (October-November 1964), 17 (March, 1965), and 18 (June 1965).

B-10711
Kornicker, L.S.
BENTHIC OSTRACODA (MYODOCOPINA: CYPRIDINACEA) FROM THE SOUTH SHETLAND ISLANDS AND THE PALMER ARCHIPELAGO, ANTARCTICA. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.167-216, 17 refs.

Benthic Ostracoda (Myodocopina: Cypridinacea) from the South Shetland Is. and the Palmer Archipelago, Antarctica, are described, including 5 new species. Cypridinacea described from within the Antarctic Convergence by earlier authors were reexamined; supplementary descriptions of some of these are presented, and some are referred to different species. The data suggest depth zonation of Ostracoda in Antarctic waters. (Auth.)

B-10712
Hedgpeth, J.W. , McCain, J.C.
REVIEW OF THE PYCNOGONID GENUS PANTOPIPETTA (FAMILY AUSTRODECIDAE, EMENDED) WITH THE DESCRIPTION OF A NEW SPECIES. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.217-229, 15 refs.

This paper reviews the taxonomic status of the pycnogonid genus Pantopipetta Stock, 1963, placing it in the family Austrodecidae. The species of Pantopipetta collected by the Eltanin, Vema, and Acona are described including a new species found off the coast of Oregon. A key to the known species of Pantopipetta is presented.

B-10713
Short, R.B.
THREE NEW SPECIES OF DICYEMA (MESOZOA: DICYEMIDAE) FROM NEW ZEALAND. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.231-249, 12 refs.

Three new species of dicyemid Mesozoa are described from the renal organs of cephalopod hosts from New Zealand waters. Dicyemids and hosts are Dicyema robsonella from Robsonella australis and D. knoxi and D. maorum from Octopus maorum. This is the second report of dicyemids from New Zealand and the first for the genus Dicyema. Of over 50 species of dicyemids, cell numbers have been reported for only 12 infusoriform larvae, including recently described Dicyemennea eltaninini (see: B-8582) and D. antarcticensis (see: B-8583) found in Antarctic waters. (Auth. mod.)

B-10714
Herb, R.
DISTRIBUTION OF RECENT BENTHONIC FORAMINIFERA IN THE DRAKE PASSAGE. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.251-300, 35 refs.

Recent benthonic Foraminifera sampling from 73 stations in the Drake Passage between South America and Antarctica shows a bathymetric zonation as well as an areal distinction of faunal provinces. Thus, assemblages of the shelf and upper bathyal zone of Tierra del Fuego (Cape Horn province) differ from those of the antarctic shelf (South Shetland province). Slight differences are also seen between assemblages of the Cape Horn province and the area of the Falkland Islands and of the Burdwood Bank (Falkland subprovince). Predominantly calcareous populations were recovered from shallow-water stations in all these areas. A progressive increase in the percentage of arenaceous Foraminifera is seen with greater depth. Calcareous perforate Foraminifera are rare in most of the southern deep-sea areas, whereas in the north the group is still dominant at many stations. Partly this distribution is probably controlled by a somewhat higher position of the CaCo3 dissolution boundary in the cold Antarctic Bottom Water of the south. A bathymetric zonation was established by plotting the upper depth limits of the most common and significant foraminiferal species. The significance of isobathyal and heterobathyal species relative to the bathymetric zonation or to other parameters is discussed. Displacement of shallow-water assemblages into deep water was recognized in several cases. (Auth. mod.)

B-10715
El-Sayed, S.Z.
OBSERVATIONS ON PHYTOPLANKTON BLOOM IN THE WEDDELL SEA. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.301-312, 22 refs.

In the course of a biological investigation carried out during the International Weddell Sea Oceanographic Expedition (Jan.-Mar. 1968), aboard the icebreaker Glacier, a very extensive bloom of phytoplankton was encountered on Feb. 10, 1968, off the Rome Ice Shelf. The bloom, which was highly developed, covered an area estimated to be at least 15,500 sq km. Dense patches of distinctly yellow-brownish color were visible for miles on end; these patches were interspersed with long, narrow bands of relatively clear water. Very dense concentrations of phytoplankton were also found on the underside of the sea ice and pancake ice. Chlorophyll a in the bloom region was as high as 190 mg/cum compared to an average of 0.37 mg/cum for the rest of the stations occupied during that expedition. Photosynthetic activity of the phytoplankton was also high at the surface (82 mg C/cum/hr); however, since the euphotic zone was shallow (10 meters), daily primary production in the photosynthetic zone was only 1.56g C/sqm. Microscopic examination of the phytoplankton samples collected showed the overwhelming abundance of a centric diatom Thalassiosira tumida however, other diatoms, many dinoflagellates, and tintinnids are also reported in the bloom region. Observations in the bloom region also included temperature, salinity, light penetration, and nutrient salts. The effects of these on the development and sustainment of the bloom are discussed. (Auth.)

B-10716
Hasle, G. , Heimdal, B.R., Fryxell, G.A.
MORPHOLOGICAL VARIABILITY IN FASCICULATED DIATOMS AS EXEMPLIFIED BY THALASSIOSIRA TUMIDA (JANISCH) HASLE, COMB. NOV.. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.313-333, 27 refs.

Coscinodiscus inflatus Karsten is an Antarctic, weakly silicified species with valve areolae arranged in sectors. Coscinodiscus tumidus Janisch is another Antarctic, coarsely silicified species with valve areolae in straight tangential or eccentric curved rows. Cells that could be classified as these two species and also cells having one valve from each of them were found mixed in colonies of Thalassiosira type. Coscinodiscus inflatus and C. tumidus are regarded as conspecific and, because of the appearance in colonies produced by long threads emerging from central apiculi and connecting the cells, are transferred to the genus Thalassiosira type. According to the rule of priority, the name should be Thalassiosira tumida (Janisch) Hasle comb. nov. A diagnosis including previous studies is presented. Observations on materials collected in Antarctic and sub-Antarctic waters and the records of species conspecific with T. tumida indicate T. tumida as a southern circumpolar species of a wide latitudinal range. A relationship between degree of silicification and valve areola pattern is discussed with reference to observations of other Thalassiosira species, grown in unialgal cultures. (Auth. mod.)

B-10717
Fryxell, G.A. , Hasle, G.R.
CORETHRON CRIOPHILUM CASTRACANE: ITS DISTRIBUTION AND STRUCTURE. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.335-346, 21 refs.

Corethron criophilum Castracane is a cosmopolitan diatom with its largest populations in Antarctic waters, often in those waters that are poor in other phytoplankton species. Its distribution and the fine structure of the siliceous parts of the cell are discussed. Two different valve types are pictured, along with three kinds of cell processes. (Auth.)

B-10718
Hopkins, T.L.
ZOOPLANKTON STANDING CROP IN THE PACIFIC SECTOR OF THE ANTARCTIC. American Geophysical Union. Antarctic research series, Dec. 3, 1971 Vol. 17, George A. Llano and I. Eugene Wallen (eds), Biology of the Antarctic Seas IV., p.347-362, 52 refs.

Zooplankton standing crop was estimated in the Pacific sector of the Antarctic between 75 W and 175 W from collections made in 1963 to 1965 on eight cruises of the Eltanin. Samples were taken with 202 mesh closing nets to depths of 2000 meters. Copepods, chaetognaths, and euphausiids made up most of the catch, with copepods averaging 67.3, 66.8, and 70.1 percent of the biomass in the Antarctic, sub-Antarctic, and convergence zone waters, respectively. Total biomass in the upper 1000 meters averaged 2.67, 2.58, and 2.96 g dry wt/sqm in the Antarctic, the sub-Antarctic, and the convergence zone, respectively. Seasonal vertical migration noted by other investigators was also evident from Eltanin material. The highest percentages (48-71) of zooplankton biomass in the top 250 meters of the 0- to 1000-meter zone were recorded for the spring and summer months of November through January. In the late fall, winter, and early spring months of May through October, the percentages declined to 4-33. Deep closing-net tows to 2000 meters indicate that 27-38percent of the biomass of the 0- to 2000-meter layer was in the lower half of the water column from March through October. Biomass in the Pacific sector of the Antarctic is compared to zooplankton abundance in other regions, and phytoplankton-zooplankton and herbivore-carnivore trophic relationships are discussed. (Auth. mod.)

B-10723
Evans, A.J.
SOME ASPECTS OF THE ECOLOGY OF A CALANOID COPEPOD, PSEUDOBOECKELLA BREVICAUDATA BRANDY 1875, ON A SUBANTARCTIC ISLAND. Australian National Antarctic Research Expeditions. Scientific reports, Ser. B(II) Zoology, 1970 No.110, p.94-97, Refs.
G845.A8

Although Macquarie I. is a relatively small oceanic island, freshwater ponds and lakes abound. The dominant species of the freshwater zooplankton is the calanoid copepod, Pseudoboeckella brevicaudata Brady 1875. This species is widely distributed throughout the Subantarctic zone. Three main types of inland water bodies occur on Macquarie I. The seasonal changes of the main limnological elements and the life cycle activity of P. brevicaudata were studied in at least one example of each type of water body. The results of this investigation revealed the presence of differences in the growth rate, morphology, reproductive activity and other life cycle phenomena, between populations of P. brevicaudata in different water bodies. An attempt was made to examine the nature and action of those environmental factors which were associated with these differences. (Auth.)

B-10756
Hasle, G.R.
VALVE PROCESSES OF THE CENTRIC DIATOM GENUS THALASSIOSIRA. Nytt magasin for botanikk, 1968 15(3), p.193-201, 7 refs.
QK1.N97

By electron microscopy three types of valve processes in Thalassiosira found in the Arctic and Antarctic (South Shetland Is.) are revealed: (1) central and marginal apiculi, (2) a solitary apiculus and (3) an additional process situated somewhere between the center and the margin of the valve. The number and arrangement of central and marginal apiculi, and the presence of either a solitary apiculus or an additional process are essential characters for distinguishing the Thalassiosira species and for their classification into groups.

B-10759
Young, S.B. , Klay, J.-R.
BRYOPHYTES IN THE 1969 CRATER OF DECEPTION ISLAND, ANTARCTICA: AN APPARENT CASE OF RAPID LONG-DISTANCE DISPERSAL. Ohio journal of science, Nov. 1971 71(6), p.358-362, 7 refs.
Q1.03

Specimens of Marchantia polymorpha, a thallose liverwort, were found on newly exposed ground in the crater formed by the 1969 volcanic eruption occurring on Deception Island, Antarctica. The nearest known source of propagules of this species is in South America, c. 1,000 km distant. Numerous propagules must have arrived on a small area of Deception Island in the recent past. Marchantia polymorpha appears to have great dispersal potential. Its absence in other Antarctic areas is probably the result of environmental rather than historical or geographical factors. (Auth.)

B-10763
Fell, J.W. , Statzell, A.C.
SYMPODIOMYCES GEN. N., A YEAST-LIKE ORGANISM FROM SOUTHERN MARINE WATERS. Antonie van Leeuwenhoek, 1971 37(3), p.359-367, 17 refs.
QR1.A55

Sympodiomyces gen. n. is described with the single species Sympodiomyces parvus sp. n. The distinguishing characteristic of this yeast-like genus is the method of a sexual reproduction: conidia are produced on a conidiophore that develops sympodially. A sexual stage has not been observed, therefore the genus is placed among the Fungi Imperfecti, family Cryptococcaceae. (Auth.)

B-10764
Robilliard, G.A. , Dayton, P.K.
NEW SPECIES OF PLATYCTENEAN CTENOPHORE, LYROCTEIS FLAVOPALLIDUS SP. NOV., FROM MCMURDO SOUND, ANTARCTICA. Canadian journal of zoology, 1972 50(1), 9 refs.
QL1.N1532

Lyrocteis flavopallidus sp. nov., a large (up to 110 mm tall) platyctenean ctenophore from the Antarctic, is described on the basis of the external morphology. The pale straw-yellow color, lack of ridges and frills on the body and arms, presence of small papillae on the body, and geographical location are considered sufficient to distinguish L. flavopallidus from L. imperatoris Komai, 1941, the only other species in the genus. The systematic placement of L. flavopallidus is somewhat uncertain because neither the anatomy of the reproductive system nor the larval development is known; the species may represent a new genus and possibly a new family. Lyrocteis flavopallidus is sedentary and usually found atop sponges or other elevated surfaces. However, it is able to move at least 1 to 2 m per day possible to attain a more advantageous feeding position. Food items are captured by the sticky tentacles and transferred to the mouth.

B-10765
Bahnweg, G. , Sparrow, F.K., Jr.
APLANOCHYTRIUM KERGUELENSIS GEN. NOV. SPEC. NOV., A NEW PHYCOMYCETE FROM SUBANTARCTIC MARINE WATERS. Archiv für Mikrobiologie, 1972 81(1), p.45-49, 2 refs.
QK504.A7

A new monocentric marine fungus Aplanochytrium kerguelensis gen. nov. spec. nov., was recovered from water samples taken in the vicinity of the Kerguelen Is. in the South Indian Ocean during a cruise of the research vessel USNS Eltanin. Aplanochytrium is very similar to Thraustochytrium Sparrow (1936) in having a chytrid-like thallus and in being able to utilize pine pollen as a substrate to which it establishes contact by well-developed rhizoids. At maturity, however, only aplanospores are formed, as in Dermocystidium sensu Goldstein and Moriber (1966). (Auth.)

B-10766
Geitzenauer, K.R.
PLEISTOCENE CALCAREOUS NANNOPLANKTON OF THE SUBANTARCTIC PACIFIC OCEAN. Deep-sea research, Jan. 1972 19(1), p.45-60, 41 refs.
GC1.D25

The stratigraphic distribution and relative frequencies of Pleistocene calcareous nannoplankton from eight Subantarctic cores and one subtropical core have been determined. The extinction and first appearance of certain species allow the division of the Pleistocene into four zones. Two have been previously described (Emiliania huxley and Gephyrocapsa Zones) one, the Coccolithus doronicoides Zone, is new, and another, the Pseudoemiliania lacunosa Zone, is redefined. Extrapolation from excess thorium-230 dates, and previously determined and dated radiolarian boundaries permit the dating of two nannoplankton zonal boundaries. The age of the Pseudoemiliania lacunosa/Gephyrocapsa datum is estimated at 520,000 to 580,000 yr. The age of the Gephyrocapsa/Emiliania huxley datum in the Subantarctic, is estimated at about 150,000 yr. During the last 400,000 yr in the Subantarctic, interglacial conditions have resulted in relatively high frequencies of Cyclococcolithus leptoporus and Coccolithus pelagicus.

B-10783
Cummings, W.C. , Fish, J.F., Thompson, P.O.
SOUND PRODUCTION AND OTHER BEHAVIOR OF SOUTHERN RIGHT WHALES, EUBALENA GLACIALIS. San Diego Society of Natural History. Transactions, March 1972 17(1), p. 1-14, 21 refs.
QH1.S3

This report describes the recording of underwater sounds and observations of the behavior of southern right whales in Golfo San Jose, Argentina, in June-July 1971, during a cruise of R/V Hero. The most common sound, a belch-like utterance, averaged 1.4 sec in duration, with most of its energy appearing below 500 Hz. The whales also produced two kinds of low-frequency moans. Other sounds were categorized as pulses, 0.06-sec bursts extending from 30 to 2100 Hz, and miscellaneous sounds, comprising numerous phonations below 1950 Hz that varied in length from 0.3 to 1.3 sec. When presented underwater playbacks of killer whale sounds, a right whale exhibited a behavior pattern called "spyhopping," but there was no obvious avoidance. An attack by five killer whales on two other right whales ended after 25 min, apparently without serious harm to the right whales. A common behavior of these southern right whales, "headstanding," may be associated with bottom feeding. Patterns of breathing varied considerably depending upon associated activities. Local citizens reported that right whales appear in Golfo San Jose and nearby Golfo Nuevo each year in late June. They are most numerous in late Aug. and Sept. and they disappear in Nov.

B-10784
Millar, R.H.
ASCIDIANS FROM THE TRISTAN DA CUNHA GROUP OF ISLANDS. Norwegian Scientific Expedition to Tristan da Cunha, 1937-1938. Results, 1967 No.53, 15p., 14 refs.

A small collection of ascidians was made from Tristan da Cunha, Nightingale and Inaccessible Islands during the Norwegian Scientific Expedition, 1937-1938. The collection contains six species, of which three are described as new, one is a known species widely distributed in southern waters, and two are not identified to species. The specimens were mainly from the level of low water, only 4 samples, representing 2 species, having been taken from greater depths. As it is unlikely that ascidians in this area are largely restricted to these levels, the collection is probably not truly representative. It does provide, however, the only comparison with the much better known ascidian faunas of southern South America, South Africa, the Subantarctic and Antarctic regions. The specimens are deposited in Det. Kgl. Norske Videnskabers Selskab Museet, Trondheim, Norway.

B-10839
Makarov, R.R.
SEPARATE EXISTENCE OF VARIOUS AGE GROUPS OF ANTARCTIC KRILL. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.547-550, Translated from its Informatsionnyi biulleten' No.77, 1970. 8 refs.
Q115.S6862

Data on the general distribution of Euphausia superba Dana obtained on cruises of the Akademik Knipovich in 1965, 1967 and 1969, and on the trawler Muksun in the eastern part of the South Atlantic Ocean show that the mature and young crustaceans are rarely seen together; the young is found southward of the mature krill. Two assumptions made to explain the reasons for this phenomenon are discussed: 1) E. superba is a plankter and, therefore, its distribution is associated with the water circulation; and 2) unlike the mature and old larvae, the younger E. superba larvae perform considerable vertical migrations, which interfere with their removal from the region of the main circulation.

B-10875
Tominaga, H.
CHLOROPHYLL A AND PHAEOPHYTIN CONTENTS IN THE SURFACE WATER OF THE ANTARCTIC OCEAN THROUGH THE INDIAN OCEAN. Antarctic record, Dec. 1971 No.42, p.124-134, 9 refs.

The chlorophyll a concentration was much higher and its fluctuation more pronounced in the Antarctic Ocean than that in the Indian Ocean. The concentrations of the Antarctic and Indian Oceans were in the range from 0.05 to 0.91 mg/cu m (averaging value 0.24mg/cu m) and from 0.02 to 0.60mg/cu m (averaging value 0.17 mg/cu m) respectively. The concentration of phaeophytin in the Antarctic Ocean was found in the range from 0.14 to 1.75mg/cu m (averaging value 0.51mg/cu m) and that in the Indian Ocean from 0.08 to 1.71mg/cu m (averaging value 0.39mg/cu m). Distribution of phaeophytin appeared to parallel

that of chlorophyll a. The Fo:Fa (fluorescence before and after acidification) ratios in the Antarctic Ocean ranged from 2.2 to 3.9 (average 3.0), while in the Indian Ocean the values were from 2.0 to 3.6 (average 2.7). However, no significant change in these ratios with water mass was observed. Further investigation is necessary to elucidate this subject.

B-10876
Salvini-Plawen, L.V.
ON PROSTOMIA OF ANTARCTIC ECHIURIDA. Über Kopflappen antarktischer Echiuriden. Zeitschrift für Morphologie der Tiere, 1972 71(1), p.26-35, In German with English summary. 12 refs.
QL1.Z29

Samples from the Ross Sea contained four prostomia ("probosces") of Echiurida which belong to two new species: The prostomium of Binoraphorus geminolobotus n.g. n.sp. shows a symmetrical arrangement of double organs. This unique dual prostomium is externally marked by two mouth openings, by a ventromedian ridge and by a bilobed distal end. The typical echiurid prostomium of Echiurus torulobotus n.sp. possesses a proximal swelling similar to that of Echiurus echiurus. It must be stated, however, that the latter is without exception a boreal-arctic form, and the present prostomia belong therefore to a geographically separated species.

B-10881
Marchant, S.
EVOLUTION OF THE GENUS CHRYSOCOCCYX. Ibis, Apr. 1972 114(2), p.219-233, 34 refs.
QL671.I22

Modern geological ideas on ocean-floor spreading are briefly reviewed. Pangea began to break up at the end of the Trias, but Africa, Antarctica and Australia remained together or close to each other til the end of the Cretaceous. Friedmann's proposal for the evolutionary spread of Chrysococcyx demands that the whole process occurred since about the start of the Pliocene. There may not have been enough time in these seven million years for the evolutionary dispersal of a genus of parasitic cuckoos halfway round the world. His proposal, which adopts the Indo-Malayan region for the origin of the genus, also regards C. osculans as an awkward throw-back, and leaves a gap between species in New Guinea and southeastern Asia that is not bridged by intermediates. An alternate proposal is suggested which supposes that the original stock was in Antarctica, and which arranges events to accord better with geological developments and avoids the evolutionary discontinuities of Friedmann's theory. The migratory habits of the cuckoos, thought by Friedmann to be significant, are discounted as evidence for evolutionary history. The parasitic habits are re-interpreted. The crucial question is whether the stock of Cacomantis and Chrysococcyx could have existed before the break-up of Gondwanaland, i.e. before the early Eocene. The present fossil record suggests that this is unlikely, but the paucity of fossils and the difficulties of paleoclimates do not seem to be insuperable and it is suggested that a southern origin for these cuckoos should be considered seriously.

B-10882
Young, E.C.
TERRITORY ESTABLISHMENT AND STABILITY IN MCCORMICK'S SKUA. Ibis, Apr. 1972 114(2), p.234-244, 15 refs.
QL671.I22

This paper describes the way in which a new pair of McCormick's Skua became established in a vacant area in a breeding colony. The pair worked out from a central point to meet neighboring birds on the original boundaries so that these became re-established. Within three days of settling most of the vacant area was claimed and the pair was behaving as a recognized member of the breeding group. Eggs were laid in the first season. Following comparison with other species it is proposed that the stability found in territory boundaries from year to year arises because territories becoming vacant are occupied by replacement pairs while neighbors are inhibited from encroaching on them.

B-10883
Cooke, F., Mills, E.L.
SUMMER DISTRIBUTION OF PELAGIC BIRDS OFF THE COAST OF ARGENTINA. Ibis, Apr. 1972 114(2), p.249-251, 19 refs.
QL671.I22

Eighteen species of sea-birds were observed from CSS 'Hudson' in the South Atlantic between the Rio de la Plata and Tierra del Fuego in late Jan. and late Feb. 1970. Major feeding areas were noted off Mar del Plata, the Valdes Peninsula and Tierra del Fuego, Argentina, the first two in rich modified or unmodified water of the Subantarctic Falkland Current, associated with upwelling. The southernmost area had most birds, and the northernmost fewest. A temperate-latitude assemblage including Yellow-nosed Albatross and Cory's Shearwater occurred off Mar del Plata in warmed water of Subantarctic (Falkland Current) origin. South of 39 degrees S these two species were replaced by Black-browed Albatross and Great Shearwater in cold offshore water of the Falkland Current. Off the Valdes Peninsula Black-browed Albatross, Great and Sooty Shearwaters, White-chinned Petrels and family groups of Magellanic Penguins occurred near the edge of highly-productive water of the Falkland Current. The largest feeding area, east of Tierra del Fuego, had Magellanic and Rockhopper Penguins, Great Shearwaters, King Cormorants, South American Terns and jaegers, but no oceanographic information is available. At 50 degrees S prions and diving petrels appeared for the first time. New southern limits for the western South Atlantic Ocean were established for Cory's and Manx Shearwaters, and the Great Shearwater was observed for the first time in Chilean waters.

B-10884
Ainley, D.G., Emison, W.B.
SEXUAL SIZE DIMORPHISM IN ADELIE PENGUINS. Ibis, Apr. 1972 114(2), p.267-271, 15 refs.
QL671.I22

Measurements of male and female Adelie penguins at Cape Crozier indicated a decline in mean weight of both sexes from mid-Oct. to mid-Nov., but males remained heavier than females, the DI (dimorphism index) for mean of all weights being -4.86. The degree of weight dimorphism decreased until mid-Nov., after which little further decrease occurred. Size dimorphism in Adelie penguins appears to be more a result of sexual differences in breeding behavior than in feeding niche utilization. Large size is advantageous for males during the establishment and maintenance of territories and pair bonds, and in reducing intraspecific competition for food.

B-10888
Yeates, G.W.
OBSERVATIONS ON ORIENTATION OF PENGUINS TO WIND AND ON COLONISATION IN THE ADELIE PENGUIN ROOKERY AT CAPE ROYDS, ANTARCTICA. New Zealand journal of science, Dec. 1971 14(4), p.901-906, 10 refs.
Q1.N525

Observations over a period of 9 weeks in the 1965-66 breeding season show that increase in windspeed increases the orientation of adult Adelie Penguins and causes them to direct their head or tail into the wind, depending on the stage of the breeding cycle. It is suggested that slaughter by man of many penguins with the resulting absence of chicks, and the covering of previous breeding areas by snowdrifts may have contributed to the change in distribution of breeding colonies since 1908.

B-10923
Chikovskii, S.S.
RARE GUEST. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.477, Translated from its Informatsionnyi biulleten' No.76, 1969.
Q115.S6862

The sudden appearance of a spindle-shaped male seal was noted in Opasnaya Bay in Alasheyev Bight, empty on April 19, because of a strange drainage wind with snow. A day later the seal was found lying on the ice-covered rocks near the ice barrier of the bay. On this calm day the seal, disturbed by a photographer, left the ice and never reappeared.

B-10926
Stirling, I.
VARIATION IN SEX RATIO OF NEWBORN WEDDELL SEALS DURING THE PUPPING SEASON. Journal of mammalogy, Nov. 1971 52(4), p.842-844, 11 refs.
QL700.J6

Studies of variation in sex ratio of newborn Weddell seals in southeastern McMurdo Sound from 1966 to 1968 showed a statistically significant change from a higher proportion of males at the beginning of the pupping season to a higher proportion of females at the end. Studies of newborn South Australian fur seals on South Neptune I., South Australia in 1969 yielded similar results. Although the sex ratio is not significantly different from unity, in samples from most species the number of males slightly outnumbers females.

B-10931
Horowitz, N.H. , Cameron, R.E., Hubbard, J.S.
MICROBIOLOGY OF THE DRY VALLEYS OF ANTARCTICA. Science, Apr. 21, 1972 176(4032), p.242-245, 30 refs.
Q1.S35

Microbiological studies of the Antarctic dry valleys are reviewed from the standpoint of their application to martian exploration. The mean low temperature, the difference in temperature between surface and atmosphere, and aridity are common to both the dry valleys and to Mars. Experiments have shown that shortage of water limits the valley life which is almost entirely microbial. It is suggested that the Mars environment is decidedly more hostile than that of the Antarctic and the fear that terrestrial microorganisms carried to Mars could multiply and contaminate the planet is unfounded. If martian life exists, it must have evolved special means for obtaining and retaining water, assuming that water is the martian biological solvent. The findings show that even under severe selective pressure, microbial life in the Antarctic has been unable to discover a comparable mechanism. However, a conclusion that life on Mars is an impossibility is not justified.

B-10940
Tkachenko, V.N. , Patin, S.A.
ARTIFICIAL RADIOACTIVITY OF SOME HYDROBIONTS OF THE SOUTHERN OCEAN (SCOTIA SEA). Oceanology, 1971 (Publ. March 1972 11(4), p.594-598, Translated from Okeanologiia. 22 refs. Fallout radionuclides in krill
GC1.03913

Artificial radionuclides were determined by gamma-spectrometry in some hydrobionts collected in the Scotia Sea in January-March 1967-1968. Zirconium-95-niobium-95, ruthenium-106-rhodium-106, and cesium-137 were identified and determined quantitatively in several samples, mainly in Antarctic krill, in 1967. These radionuclides are most likely of atmospheric origin and are products of nuclear explosions. The accumulation of noticeable amounts of fission products in the krill makes possible an indicator hydrobiont for detecting the gamma-emitters in question in the photic layer of the Antarctic water masses.

B-10944
Bogdanov, A.S.
PROBLEMS IN THE UTILIZATION OF THE BIOLOGICAL RESOURCES OF THE OCEAN. Oceanology, 1971 (Publ. May 1972) 11(5), p.699-702, Translated from Okeanologiia.
GC1.03913

The importance of the exploitation of the biological resources of the World Ocean including the Southern Ocean in order to provide animal proteins for the world's increasing population is assessed. The dynamics of the growth of fish catches, status of existing fish reserves, and possible size of future catches are analyzed. The main tasks of fishery science in increasing fish catches and enlarging the ocean's biological resources are outlined. Legal aspects of fishing in the open ocean are considered. Attention is directed toward the possible commercial use of krill and active intervention in the biological processes to boost the commercial productivity of the ocean.

B-10963
Chichvarin, V.A. , Ptitsyn, V.I.
CONSERVATION OF THE NATURAL RESOURCES OF THE ANTARCTIC--AN INTERNATIONAL PROBLEM. Antarctic (Antarktika), 1971, p.136-147, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 3 refs.

The Antarctic is the only extensive biogeographic region with a real possibility of averting the alteration and destruction of a local ecological system, and creating a natural laboratory for scientific purposes. The thorough study of its biology will serve as a basis for developing rational methods of its economic utilization. The Antarctic Treaty (1961) provided for periodic conferences on conservation, the preliminary research for which was assigned to SCAR. The "Agreed Measures for the Conservation of Antarctic Flora and Fauna," adopted at the 3rd Consultative Meeting in Brussels in 1964, possess the necessary legal obligations and are contained within the framework of the Antarctic Treaty. The conservation region, established by recommendation of SCAR, includes the Antarctic continent, the shelf ice, and all islands south

of 60 degree S. The importation of nonrepresentative species to the Antarctic, with the exception of sled dogs and domesticated plants and animals, is prohibited. The preparation of a list of "Specially preserved species" and "Specially preserved regions" was assigned to SCAR. (For Russian original see B-5047)

B-10964
Syroechkovskii, E.E.
ORNITHOLOGICAL AND BIOGEOGRAPHICAL STUDIES OF ANTARCTICA. Antarctic (Antarktika), 1971, p.148-187, TT 59072. Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 6 refs.

Ornithological investigations were conducted in 1957 on Wilhelm II Coast, Queen Mary Coast, and the west part of Knox Coast, with special attention devoted to Haswell Island and the Bunger Hills. A search was conducted for evidence of life in the more severe regions. Descriptions are given of the communities, life cycles, physiological features, and behavior of the following Haswell I. birds: Adelie penguin, bearded penguin (1 specimen), emperor penguin, cape pigeon, silver-grey petrel, Antarctic petrel, south polar skua, and southern black-backed gull (1 specimen). The biogeographical features and ecology of Haswell I. in particular and the studied region in general are discussed, and biocoenctic associations determining the biogeographic structure of dry land in the Antarctic are diagrammed. The fauna of the Bunger Hills, which is very poor, is discussed only generally. A short classification of Antarctic birds and a guide to species identification are appended. (For Russian original see B-5048)

B-10982
Makushok, V.M.
RATTAILS (MACROURIDAE, PISCES) OF THE ANTARCTIC (BASED ON COLLECTIONS OF THE OB' DURING 1956-1963). Dolgokhvosty (Macrouridae, Pisces) Antarktiki (po sboram d/e "Ob" 1956-1966 gg.. Akademiia nauk SSSR. Institut okeanologii. Trudy, 1972 Vol.93, p.250-276, In Russian with English summary. 34 refs.
GC1.A4

Antarctic benthic Macrourid fishes collected by the Ob in 1956-1963 are represented by 3 species: Coryphaenoides ferrieri (Regan), Cynomacrurus piriei Dollo, and Macrourus whitsoni (Regan). All 3 species, previously known from the Atlantic, Indian and western Pacific sectors, were taken by the Ob for the first time in the eastern Pacific sector of the Antarctic indicating the possibility of circumpolar distribution of the species. Detailed morphologic description of the material is given and suggestions concerning the validity of M. whitsoni are made.

B-10983
Akademiia nauk SSSR. Institut okeanologii.
Rass, T.S. ed
PACIFIC OCEAN [VOL. 7]. BIOLOGY OF THE PACIFIC OCEAN. BOOK III. FISHES OF THE OPEN WATERS. Tikhii okean [Tom 7]. Biologiia Tikhogo okeana. Kn. III. Ryby otkrytykh vod. Moskva, Nauka, 1967, 273p., In Russian. Numerous refs.
GC771.A35

Data on surface and deep-water fishes of the Pacific Ocean, including its southern part, obtained by Soviet and non-Soviet scientists up to 1966 are summarized. Taxonomy, morphology, and geographic distribution of the most important fish groups are presented and the pattern of ichthyofauna distribution in different oceanic areas is shown.

B-10997
SEALS SAFEGUARDED BY NATIONS' CONVENTION. Antarctic, Mar. 1972 6(5), p.150
G845.A55

A new convention to safeguard all species of Antarctic seals has been adopted by the 12 Antarctic Treaty nations after a nine-day conference in London. The convention will ensure that if commercial sealing begins on the sea ice surrounding the continent, the killing of certain species will be prohibited, and the taking of other species will be subject to strict limits. The conference agreed that not more than 175,000 seals should be killed annually. Under the convention the Ross seal, the elephant seal, and the fur seal cannot be killed, and killing quotas have been fixed for the crabeater, Weddell, and leopard seals. The convention will come into force after seven countries represented at the conference have signed and ratified it.

B-11034
Rudolph, E.D.
POLLUTION IN ANTARCTICA. Geographical review, July 1972 62(3), p.422-423
G1.G35

A series of recent papers by Antarctic researchers on the preservation of the Antarctic environment (1971;B-9601-9608) points out that man-made environmental changes have created the need for greater awareness of conservation in the Antarctic. At the larger stations along the coast, in the dry valleys, and near rookeries, pollution is a threat to animals, area pristinity, and scientific studies. Three of the possible sources of pollution effecting benthos have been pinpointed as heated sea water released from the nuclear power plant; inorganic trash; and organic food and sewage wastes. An apparent lack of conservation awareness by station personnel in the past has contributed to the station-related pollution effecting penguins and skuas near Hallett Station. However, the McMurdo Land Management and Conservation Board, a cooperative environmental protection effort of the U.S. and New Zealand, has been successful in cleaning up the ice-free valleys and setting aside a controlled visitors' site at Cape Royds to protect the wildlife. Increased understanding of the problems should result in further recommendations for conservation measures and probably greater on-the-spot enforcement.

B-11044
Harper, P.C. , Watson, G.E., Angle, J.P.
NEW RECORDS OF THE KERGUELEN PETREL (PTERODROMA BREVIROSTRIS) IN THE SOUTH ATLANTIC AND PACIFIC OCEANS. Notornis, March 1972 19(1), p.56-60, 18 refs.
QL671.N65

The range of the Kerguelen Petrel (Pterodroma brevirostris) is outlined and extensions into the South Atlantic and Pacific Oceans, based on observations from the ships Eltanin and Eastwind, are documented, suggesting a nearly circumpolar movement. "At sea" characters of flight pattern, plumage appearance and foot color are noted.

B-11045
Robertson, C.J.R.

PRELIMINARY REPORT ON BIRD BANDING IN NEW ZEALAND 1964-1971. Notornis, March 1972 19(1), p.61-71
QL671.N65

Bird banding activities in New Zealand, including the Subantarctic islands Antipodes, Auckland, Campbell, and Snares, are reviewed for the period April 1, 1964 to March 31, 1971. Because of historically different recording methods used the totals for birds banded and recovered are only provisional and represent a minimum figure. Dramatic increases in banding activity since 1964 are noted. Forty-one new species have been banded in the last seven years and a notable aspect of this is the start on studies of native bush birds. The provisional total of recoveries and repeats is 113,384. Just over 100,000 of these are currently in computer storage, the majority of them having been converted since 1968. On present indications close to 20,000 new recoveries and repeats will be added during the 1971/72 year. A selection of the interesting recoveries received from non-game birds during the period 1964-71 is shown.

B-11049
Ainley, D.G. , Schlatter, R.P.
CHICK RAISING ABILITY IN ADELIE PENGUINS. Auk, July 1972 89(3), p.559-566, 20 refs.
QL671.N9

The ability of different aged adult Adelie penguins (Pygoscelis adeliae) to provide their chicks with food from the creche stage to fledging was studied by comparing the sizes of the broods and the growth patterns of the chicks. Adelie chicks from single broods attained 90-108 percent adult minimum weight and dropped to 75-89 percent at fledging. Less-than-adult maximum chick weights suggested that feeding irregularity is not a problem for the chick compared to other species in which chicks gain fat reserves. There was a lack of extra fat in chicks that find their own food but still enough to protect against foraging difficulties. Chicks from one-chick broods weighed more than those from two-chick broods, the latter usually losing a chick before fledging indicating that foraging problems make it difficult for adult Adelies to raise more than two chicks. It has been determined that Adelies raise more and heavier chicks as they age from 3 to 6 years and that breeding delays allow time to acquire necessary foraging skill to rear chicks.

B-11072
Lin, Y. , Duman, J.G., DeVries, A.L.
STUDIES ON THE STRUCTURE AND ACTIVITY OF LOW MOLECULAR WEIGHT GLYCOPROTEINS FROM AN ANTARCTIC FISH. Biochemical and biophysical research communications, Jan. 14, 1971 46(1), p.87-92, 13 refs.
QH301.B358

Two groups of low molecular weight glycoproteins were isolated from the blood serum of an antarctic fish Trematomus borchgrevinki. The complete structures, both the amino acid sequence and the configuration of the carbohydrate moieties, have been studied. The two glycoproteins are similar in structure but different in size. Solutions of these glycoproteins display a thermal hysteresis similar to that of solutions of larger glycoproteins previously isolated from the same fish.

B-11111
Schalke, H.J.W.G. , Zinderen Bakker, E.M. van, Sr.
HISTORY OF THE VEGETATION. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971. p.89-97, 12 refs.
QH199.5.S68

The peaty deposits found on subantarctic islands are of great value in pollen analytical studies on Quaternary climatic changes. The following problems are discussed in this connection: the dampening effect of the hyperoceanic climate on climatic changes, the possible former shifts in the position of the Polar Front, the scarcity of plant species as climatic indicators and the possibilities of dispersal of pollen grains and spores over long distances. Two cores from Marion I. and one from Prince Edward have been analyzed. The oldest core covers about 16,000 yr. (Marion) and the diagram indicates: colder conditions prior to 16,000 B.P., climatic amelioration between 16,000 and about 11,500 B.P. and conditions resembling present day climate during the last 10,000 yr. A decrease in temperature of 2 to 3 deg C during the cold phase can be inferred from the pollen results. During this cold phase extensive parts of the island Marion must have been covered by glaciers as is also indicated by geological evidence. The postglacial black lava which covers extensive areas of the islands must have a minimum age of about 2,700 to 4,000 years according to C-14 age determinations of superimposed peat deposits.

B-11112
Huntley, B.J.
VEGETATION. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971. p.98-160, 124 refs.
QH199.5.S68

Marion and Prince Edward Is. comprise composite volcanic peaks rising over 1,200 m above sea level. Two distinct lava types, pre- and post-glacial, are recognized and their influence on the vegetation described. The islands' soils are classified into three major groups: lowmoor peat, highmoor peat and rawmark, on a basis of organic matter content and water relations. The islands' climate is reviewed, the chief features being the low mean annual temperature, 5.5 deg C, and small range in monthly mean, 4.2 deg C. The very high rainfall, over 2500 m per annum, is also a factor of great ecological importance. Twenty-two species of indigenous vascular plants are noted including four new records and the affinities of the indigenous and alien vascular flora are discussed. Thirteen "noda" were synthesized on a basis of floristic composition and autecological characteristics and grouped according to the most important factor controlling their distribution, such as salt spray deposition, biotic activity, drainage and wind exposure. The noda are described in detail, notes being given on their edaphic and microclimatic conditions, the influence of animals, floristic composition, vitality and phenology, and in particular, the autecology of the dominant vascular plants.

B-11113
Zinderen Bakker, E.M. van, Jr.
COMPARATIVE AVIAN ECOLOGY. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971. p.161-172, 16 refs.
QH199.5.S68

The ecology of the birds breeding on Marion and Prince Edward Is. has been studied. A description is given of six different ecological areas which can be distinguished for bird life.

The greatest number of birds breed in burrows while large rockeries occur along the coast. The nests found highest on the islands are those of the South Georgian Diving Petrels and Salvin's Prions which make their burrows in cinder slopes up to about 600 m altitude. The habitat preferences of 26 species of breeding birds is described. The birds form a definite link between the oceanic and the terrestrial ecosystems and have a strong influence on the vegetation in enriching the soil and in causing extensive erosion down to the solid rock. The competition for food by the birds especially during the chick-rearing period, is discussed in connection with their breeding cycle and their food preferences. The millions of birds breeding on the islands forage mainly on the rich fauna of crustacaens, cephalopods, fish and molluscs occuring round the islands. A food web for these ecosystems is given.

B-11114
Zanten, B.O. van
MUSCI. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.173-227, 30 refs.
QH199.5.S68

Eighty species of mosses have been collected on Marion and Prince Edward Is. Six of these could not be identified as they were in a poor and sterile state. Four species collected on Bouvet I. have also been included. The possible origin of the moss flora is discussed. The distribution of the species, as far as it is know at present, is given. No endemic species have, so far, been found on Marion and Prince Edward Islands. The number of taxa which are common to the islands and South Africa is small (12 or 13). 76 per cent of the taxa occur also West of the islands, whereas only 11 per cent are exclusively found West of them. 82 per cent of the species occur also East of the islands, while only 22 per cent are exclusively found East of them. From these data it is not possible to decide whether the moss flora came from areas to the East or to the West of Marion and Prince Edward, although the latter origin is more probably because of the prevailing wind system. Unattached moss balls are found on both islands. A key to the genera, and indices of collecting numbers and binomials are given. One new species, Ditrichum immersum Zant., is described and six new combinations are made.

B-11115
Grolle, R.
HEPATICOPSIDA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.228-236, In German with English summary. 18 refs.
QH199.5.S68

Thirty-six species of liverworts from Marion and Prince Edward Is. are listed. Andrewsianthus carinatus and A. lancistipus are described as new and are figured. Eleven species have been recorded on the islands for the first time. According to their distribution the 36 species can be subdivided as follows: 9 are endemic, 4 belong to the Kerguelen Province, 9 to the Kerguelen and Magellanic Provinces, 3 to the Cape and the Megellanic Province, 9 are circumsubantarctic, 1 is a Cape species and 1 is atlantic in distribution. The liverwort flora of Marion and Prince Edward Is., is clearly dominated by subantarctic elements. It is not rich in species and these are not very specialized as compared with subantarctic regions of the same latitude in Patagonia and on the subantarctic islands of New Zealand.

B-11116
Joubert, J.J.
PRELIMINARY MICROBIOLOGICAL STUDIES. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.237-240, 14 refs.
QH199.5.S68

Eight samples of rusty brown material occuring in swampy places on Marion and Prince Edward Is. were investigated on their content of "iron bacteria". Typical sheath forming iron precipitating bacteria (Chlamydobacteriales) were not found. The ferric iron-containing precipitate could have originated from organic salts or complexes. The organic radical could be destructed by bacteria or other micro-organisms. None of the cultures could be shown to be obligately psychophilic.

B-11117
Winterbottom, J.M.
POSITION OF MARION ISLAND IN THE SUB-ANTARCTIC AVIFAUNA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.241-248, 11 refs.
QH199.5.S68

In order to "place" the Marion I. avifauna in relation to those of other Subantarctic areas the breeding birds of the four orders Sphenisciformes, Pelecaniformes, Procellariiformes, and Charadriiformes are compared for the following islands: Falkland, South Georgia, Tristan da Cunha group, Marion, Crozets, Kerguelen, Heard, Macquarie, Auckland group, Campbell, and the Antipodes group. These islands contain 59 breeding species of these orders, falling into 9 families. The results of the study indicate that 1) each of the subantarctic island groups has an avifauna recognizably different from any of the others; 2) the avifaunas of the Crozets and Heard I. are impoverished versions of that of Kerguelen; 3) the influence of the physical properties of the surface waters has been over-emphasized in explaining seabird distribution; 4) the influence of the west winds and of mere distance has been underestimated; and 5) the avifauna of Marion I. has most in common with those of the Crozets and Kerguelen, the two nearest island groups.

B-11118
Zinderen Bakker, E.M. van, Jr.
BIRDS OBSERVED AT SEA FROM PRINCE EDWARD ISLAND TO CAPE TOWN. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.249-250, 2 refs.
QH199.5.S68

Observations of birds made aboard the vessel RSA on the return voyage from Prince Edward I. to Cape Town are reported. Twenty-five species of seabirds were found breeding on the Marion and Prince Edward Is. In addition one Black-bellied Storm Petrel Fregetta tropica was seen. During the voyage itself seventeen species were observed. The number and latitudinal distribution of each species sighted are given.

B-11119
Zinderen Bakker, E.M. van, Jr.

BEHAVIOUR ANALYSIS OF THE GENTOO PENGUIN (PYGOSCELIS PAPUA FORSTER). Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.251-272, 25 refs.
QH199.5.S68

A detailed daily study was made of the behavior of the Gentoo Penguin on Marion I. during 1965-66. Only rarely are two chicks reared. Special attention is given to the predators which are mainly enemies of the young birds.

B-11120
Zinderen Bakker, E.M. van, Jr.
GENUS DICMEDEA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.273-282, 11 refs.
QH199.5.S68

The breeding cycles of Diomedea exulans, D. chrysostoma and D. chlororhynchos is described. The last-named species, the yellow-nosed Albatross, is a new record for Prince Edward and was previously known only from Tristan da Cunha, Gough and St. Paul. The number of chicks of this species is estimated to have been 2000 during the 1965/66 season. A detailed description is given of the behavior of D exulans. A high mortality of chicks was noticed in this species, the breeding cycle of which occupies between 13 and 15 mo. It is possible that this high mortality was partly due to the systematic observations made.

B-11121
Andriiashev, A.P.
PISCES. DETERMINATIONS. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.283, Abstract only.
QH199.5.S68

A small collection of only four specimens was studied and the following determinations were made: Notothenia coriiceps Rich. - 1 specimen; Notothenia macrocephala Glunth. - 2 specimens; and Harpagifer bispinis subsp. Maricnensis Nybelin. - 1 specimen. Both species of Notothenia were found at Marion I. for the first time, while only two specimens of Harpagifer were collected by the Challenger Expedition.

B-11122
Bernasconi, I.
ECHINODERMATA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.284-287, 10 refs.
QH199.5.S68

Four species of Asteroids have been determined and one new species of Ophiuroid, viz. Nullamphiura marionensis Bernasconi is described. The material was collected in Transvaal Cove on Marion I. and has close affinities with both the Kerguelen and Magellanic Provinces.

B-11123
Pawson, D.L.
HOLOTHUROIDEA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.288-290, 15 refs.
QH199.5.S68

Only four species of Holothuroidea have so far been recorded off the intertidal zone of the islands Marion and Prince Edward. Two of these have again been collected by the South African Expedition. Three of these species are also known from the vicinity of Kerguelen. One of the species is common in the southern South American fauna. As far as records are available no species from Marion or Prince Edward are shared with South Africa or Australia.

B-11124
Gaillard, J.M.
MOLLUSCA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.291-300, In French with English summary. 52 refs.
QH199.5.S68

A survey is given of 51 species of marine molluscs which have been recorded from the littoral zone of the islands Marion and Prince Edward and from the surrounding surface water and deep ocean. One new variety, Laevilitorina caliginosa (Gould, 1848) var. nov. fulleric Gaillard, has been described. The radula of these specimens is the same as for L. caliginosa, but the columella of the new variety is more straight. Of the species enumerated 17 deep sea molluscs have only been recorded once by the Challenger and Discovery Expeditions, which shows that the data on marine molluscs of the Southern Ocean are still very incomplete. The ten species which have been collected in the littoral zone of Marion and Prince Edward during the Expedition are listed. Besides these species forty-one, which have been recorded from the ocean near the islands Marion and Prince Edward, have been enumerated. The synonyms, distribution and references for all the species are given.

B-11125
Lawrence, R.F.
ARANEIDA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.301-313, 30 refs.
QH199.5.S68

Four species of spiders are known from Marion I. two of which were collected for the first time by the South African Expedition. It seems highly improbable that not more than four species are living on Marion I. Spiders can be dispersed to these islands by ocean currents, by wind or through the agency of man. The genera Desis and Amaurobioides, which so far have not been recorded on Marion I., could be dispersed on floating sea weed. Erigone vagans could have reached the island through the air as the emergent young practice the ballooning habit. Myro kerguelenensis and M. paucispinosus may have been introduced by man. A number of spiders collected on southern islands is also listed.

B-11126
Pletzen, R. van , Kok, D.J.
ORIBATEI. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.314-326, 21 refs.
QH199.5.S68

A large collection of Oribatei from Marion and Prince Edward Is. and a few specimens from Bouvet I. have been studied. Eight species have been identified from Marion, two from Prince Edward and one from Bouvet. Single specimens of two other species could not be identified to species level as they were badly preserved. The

material contained three new species from Marion, viz. Dometorina marionensis, Zygoribatula subantarctica and Totobates marionensis, one new species from Prince Edward, viz. Halozetes crozetensis and one from Bouvet, viz. Alaskozetes bouvetoyaensis. Although the Oribatei are usually widely distributed the five species, which are not endemic, have so far been recorded only from the islands of the Kerguelen Province.

B-11127
Theiler, G.
IXODOIDEA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.327-334, 85 refs.
QH199.5.S68

The ticks found on marine birds are listed and the records are analyzed; their continental and oceanic distribution summarized. Attention is drawn to the taxonomic tangle in the three groups; O. capensis-O. coniceps, C. uriae, and I. auritulus. More detailed notes are given on the three species found on Marion I., C. uriae, I. pterodromae and O. capensis (s.str.). The biological requirements for maintenance and dispersal are briefly noted. Seventy-five references are listed, each entry indicating the tick species treated in the text.

B-11128
Dreux, P.
INSECTA. ENTOMOLOGICAL FAUNA OF MARION AND PRINCE EDWARD ISLANDS. Insecta. La faune entomologique des Iles Marion et du Prince Edouard. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.335-343, In French with English summary. 29 refs.
QH199.5.S68

The South African Expedition to the islands Marion and Prince Edward collected three new specific or sub-specific forms: Pringleophaga kerguelensis marioni Viette (Lepid.) and Paractora dreuxi mirabilis Seguy (Dipt.), and probably a new Sminthurinus (Coll.). The following species have been recorded for the first time from this archipelago: Kleidotoma icarus (Hymen.), Listriomastax litorea (Dipt.), Scrensia dreuxi, Cryptopygus antarcticus, Proisotoma pallida (Coll.) already known from the Crozet Is., Rhopalosiphum padi, Neomyzus circumflexus, Macrosiphum euphorbiae, Brachycaudus helichrysi, cosmopolitan aphids. A short survey is given of the endemism and origin of the entomological fauna of the Marion and Prince Edward Is. and the unity of the biogeographic province of Marion-Crozet-Kerguelen-Heard, which becomes more and more evident, is stressed.

B-11129
Seguy, E.
DIPTERA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.344-348, In French with English summary. 10 refs.
QH199.5.S68

In the collections of the South African Expedition to the Marion and Prince Edward Is. the following Diptera have been recorded: Limnophyes pusillus, Telmatoscopus albipunctatus, Pericoma sp., Paractora dreuxi, Apetenus litoralis, Listriomastax litorea (new for the archipelago), Fannia canicularis. The subspecies mirabilis of Paractora dreuxi is described.

B-11130
Viette, P.
LEPIDOPTERA. (HETEROCERA: TINEIDAE, HYPONOMEUTIDAE). Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.349-354, 19 refs.
QH199.5.S68

Due to adverse climatic conditions and scanty vegetation, the lepidopterous fauna of the subantarctic islands is poor in species. It is therefore not surprising to find in the Marion I. group, which is furthermore strongly isolated, only three species of Heterocera: two of Pringleophaga Enderlein (Tineidae) and one of Embryonopsis Eaton (Hyponomeutidae). The species of these genera present a striking case of parallel development and, although representing different families, are in general appearance very similar. The more conspicuous features are the strongly reduced wings and the well developed legs. Exactly similar features are found in a number of subantarctic species belonging to different families. These similarities accentuate clearly the important role played by the ecology of the biotope on parallel development of certain characters in otherwise widely separated lepidopterous families. Such characters may have evolved in response to the very rough climate prevailing on all subantarctic islands where the vegetation is consequently reduced in height and provides little shelter for winged insects which would be blown away in such large numbers that the species would disappear, unless adaptation took place to counteract this danger.

B-11131
Kuschel, G.
CURCULIONIDAE. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.355-359, 8 refs.
QH199.5.S68

The curculionid fauna of Marion and Prince Edward Is. contains five species altogether, four being endemic. Five species occur on Marion I. and three on Prince Edward Island. All five species belong to the more specialized genera of Ectemnorhinae. Every endemic species has its closest relative outside the islands. Some discussions on the intertidal Palirhoeus eatoni (C. O. Waterhouse) and on the extremely variable Ectemnorrhinus similis (C. O. Waterhouse) are presented, the generic name Palirhoeus being proposed as new. It is not known whether these weevils are diurnal or nocturnal. They have a wide range of feeding habits. This adaptation and the fact that the larvae are living in the soil may have enabled their survival on the islands during the glaciations.

B-11132
Emerson, K.C.
MALLOPHAGA. DETERMINATIONS. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.360, Abstract only.
QH199.5.S68

Determinations made of the Mallophaga collected from birds on Marion I. during the 1965-1966 expedition are listed. Several host records are new.

B-11133
Smith, W.A. , Sayers, R.L.
ENTOMOSTRACA (WITH A RESUME ON ALL ENTOMOSTRACA RECORDED FROM THE ANTARCTIC AND THE SUB-ANTARCTIC ISLANDS). Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.361-372, 71 refs.
QH199.5.S68
A collection of 136 samples from Marion and Prince Edward Is. were examined and 9 species of Entomostraca, were identified, namely: Daphniopsis studeri, Macrothrix hirsuticornis, Alona weinecki, Pleuroxus aduncus wittsteini, Ilyodromus kerguelensis, Pseudoboeckella volucris, Tigriopus angulatus, Marionobiotus jeanneli, Epactophanes richardi antarcticus. Of these species, Ilyodromus kerguelensis and Tigriopus angulatus are new records for the islands. Brief notes on the environmental preferences of the species are included and also tables which list all known Entomostraca from the antarctic and subantarctic islands and from southern South America, and which give the synonymies used in this paper.

B-11134
Grindley, J.R.
TIGRIOPUS ANGULATUS LANG. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.373-378, 11 refs.
QH199.5.S68
Specimens of Tigriopus angulatus Lang (Copepoda Harpacticoida) from Marion I. are described and illustrated and the relationships of this species are discussed.

B-11135
Cleret, J.J.
ISOPODA. TWO NEW SPECIES OF ASELOTE ISOPODES ON MARION ISLAND. Isopoda. Dreux especes nouvelles d'Isopodes Asellotes a l'ile Marion. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.379-383, In French with English summary. 10 refs.
QH199.5.S68
Aselote Isopodes, collected on Marion I., contain genera already known from many antarctic and subantarctic stations (Jaeropsis, Jais, Janira, and Paramunna). The genera Antias and Munna are both represented by new species, Antias bicornis n.sp. and Munna (Munna) instructa n.sp. respectively. The genus Antias is almost exclusively southern and is well represented in the antarctic and subantarctic zones while the genus Munna is found in both hemispheres. The two new species also present a common characteristic: a very pronounced sexual dimorphism, extreme for each of the genera considered. Only 6 males and 2 females of Antias bicornis n.sp. and 4 males and 1 female of Munna instructa n.sp. have been collected in the littoral of Marion I. Antias bicornis n.sp. can be distinguished from the other ten species of the genus by its greater size and by the structure of the mandible of the male. Munna instructa n.sp. belongs to the sub-genus Munna Menzies, 7 species of which are found in the Antarctic and Subantarctic regions. Munna instructa is geographically isolated and the male possesses a pereipode, which is different from that of the other species of the sub-genus.

B-11136
Day, J.H.
POLYCHAETA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.384-390, 27 refs.
QH199.5.S68
A collection of 25 species of Polychaeta collected at four stations in the intertidal zone of Marion I. has been described. The tidal level at which each specimen was found, the color in life and the breeding condition have been recorded. The species are widespread in the Subantarctic region, except for one species (Orbiniella minuta) which is only known from Tristan da Cunha and Marion I. One new subspecies, Spirobis (Romanchella) perrieri marionensis is described.

B-11137
Sims, R.W.
OLIGOCHAETA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.391-393, 6 refs.
QH199.5.S68
Collections of Oligochaeta have been studied from Marion, Crozet, Kerguelen, Amsterdam and St. Paul Is. The earthworm faunae of the southern islands are very poor in species. A number of species are endemic to certain islands, but a revision of the genus Microscolex may prove that many of these endemics are only geographical races of three or four polytypic species.

B-11138
Dollfus, R.P.
HIRUDINEA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.394-395, In French with English summary. 3 refs.
QH199.5.S68
Two species of Hirudinea have been collected on Marion I. One of these is Antarctobdella tchnerniai R.Ph. Dollfus, while the other species represented by two specimens must belong to an unknown genus.

B-11139
Millard, N.A.H.
HYDROZOA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.393-408, 29 refs.
QH199.5.S68
Eleven species of hydroids from Marion I. are described. Of these two are new species, namely Campanularia subantarctica and Symplectoscyphus marionensis. The hydroid fauna shows relationships with that of Antarctic and Subantarctic waters, but none with South Africa.

B-11140
Cutress, C.E.
ACTINARIA. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.409-410, 2 refs.
QH199.5.S68
Two species of sea anemones collected in the intertidal zone of Marion I. are described. Material of Parantheopsis cruentata (Couthouy,

1846) shows some variation as it lacks verrucae. Four other specimens could be Bunodactis mortenseni (Carlgren, 1924), but no positive identification could be made.

B-11141
Grospietsch, T.
RHIZOPODA. CONTRIBUTIONS TO THE ECOLOGY OF TESTACEAN RHIZOPODA ON MARION ISLAND. Rhizopoda. Beitrag zur Ökologie der testaceen Rhizopoden von Marion Island. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971. p.411-423, In German with English summary. 27 refs.
QH199.5.S68

Twelve samples collected on Marion I. were studied on their rhizopod content and the composition sequence of new species, varieties and forms were described and illustrated, viz. Diffugiella oviformis var. fusca f. major, Nebela antarctica, Nebela playfairi var. elongata, Nebela playfairi var. lata, Nebela vas var longicollis and Nebela vas var. obliqua. The samples from the swamps are the richest in species, although Sphagnum does not take part in the formation of peat. Sphagnum is replaced by several species of mosses and liverworts. All the faunal lists available for the Antarctic and the islands of the southern seas have been compiled in comparative tables. This survey shows that the Nebela species, which are purely austral in their distribution, were until recently, known outside the continents, only from New Zealand and Tasmania. They have now also been recorded from swamps on Marion I. As the majority of the earlier records dealt only with random samples from different biotopes which were not swamps, it can be assumed that Nebela occurs wherever peat formation has taken place.

B-11143
Simpson, K.N.G. , McEvey, A.R.
SNARES CRESTED PENGUIN: TWO AUSTRALIAN RECORDS. Emu, July 1972 72(3). p.110-111, 11 refs.
QL671.E5

Examination of a number of skins of the penguin genus Eudyptes Vieillot 1816 from the collections of several museums in Australia has revealed two specimens of a subspecies of Eudyptes new to Australia which have been identified as Snares Crested Penguins. The specimens, from the South Australian Museum and the Tasmanian Museum and Art Gallery, were collected at Cape Banks, south-eastern South Australia on Jan. 8, 1914 and on the south-eastern Tasmanian coast near Hobart on Aug. 27, 1951, respectively. The structural characters and plumage of both specimens agree with those of a specimen of the same subspecies in the National Museum of Victoria collected at Macquarie I. in 1958, and with those of two adult skins in the Dominion Museum, Wellington, N.Z. collected at the Snares Is. and loaned for examination. Characteristics confirming the identity and probable age of the penguins as adults are given. The Snares Is. are the only known breeding stations for this subspecies.

B-11145
Beck, J.R. , Biology of Wilson's Storm Petrel
BIOLOGY OF WILSON'S STORM PETREL, OCEANITES OCEANICUS (KUHL), AT SIGNY ISLAND, SOUTH ORKNEY. British Antarctic Survey. Scientific reports, 1972 No.69, 54p., 89 refs.
QH199.B73

Observations on the ecology of Wilson's storm petrel at Signy I. over three seasons are described and compared with studies of storm petrels in other parts of the world. The reproductive cycle is similar to that of other storm petrels, but the abundant food supplies in Antarctic waters in summer may allow O. oceanicus to form a proportionately large egg more quickly, incubate in shorter spells and allow the young to grow faster. Egg-laying and breeding success are greatly influenced by snowfall. A detailed account of the breeding cycle is given. Overall breeding success during the study period was very low, due mainly to problems caused by drifting snow blockage. A comparison of mist-net catches over the three seasons showed a 40 per cent decline in the number of birds in flight over the colony in 1967-68. Extrapolation from the study colony gave an estimated total population for the island of approximately 200,000 pairs. Adult survival in a small sample of ringed birds was high--90.8 per cent per annum. Seasonal variation in body weight was marked, culminating in a rapid increase at the end of the season. Other topics discussed include brook-patch development, intermittent breeding, food and feeding, and moult.

B-11180
Roberts, P.E.
PLANKTON OF PERSEVERANCE HARBOUR, CAMPBELL ISLAND, NEW ZEALAND. Pacific science, July 1972 26(3). p.296-309, 43 refs.
QH1.P2

Surface plankton samples from Perseverance Harbor, Campbell I., New Zealand, were analyzed and species presence was related to hydrological factors. The hydromedusae Obelia geniculata and Phialella quadrata and the ctenophore Pleurobrachia pileus did not occur when sea temperatures fell below 7 deg C. However, Bougainvillia macloviana was present throughout the year. Larvae of decapod crustaceans were released immediately after sea surface temperatures began to rise from their winter minima. Spring samples were dominated by decapod crustacean larvae, but in 1967 abnormally low sea surface temperatures were recorded and few decapod crustacean larvae were collected. Hermit crabs released more larvae in both spring and autumn. Other crabs released most larvae in spring. Perseverance Harbor has a typical inlet plankton and is influenced by both New Zealand and circumpolar subantarctic faunas. The seasonal cycles are typical of temperate rather than Antarctic waters.

B-11200
Lindsay, K.L.
NANORCHESTES ANTARCTICUS STRANDTMANN; A TAXONOMIC DESCRIPTION OF THE INSTARS. Acarologia, 1972 13(4). Ohio State University. Institute of Polar Studies. Contribution No. 204. p.593-614. 11 refs.
QL458.A2A2

Nanorchestes antarcticus has 6 instars. They are 1) prelarva which is passed through within the egg within the female and is characterized by a pair of 3-segmented palps; 2) larva which is orthotrichous and exhibits several unusual characters; 3) protonymph with 1 pair of genital setae; 4) deutonymph with 3 pairs of genital setae; 5) tritonymph with 6 pairs of genital setae; and 6) adult with 8 pairs of genital setae. The male has 7 pairs of eugenital setae and probably produces a spermatophore. The female is ovoviviparous, produces 1 or more eggs at a time, and has a very short ovipositor with 3 pairs of eugenital setae. Setae show a

concentration on the antiaxial surfaces of the legs, and throughout ontogeny certain leg setae branch. One solenidion is added during development. The femurs of legs I and IV are undivided when they appear.

B-11201
Roberts, P.E.
ZOEA LARVAE OF PAGURUS CAMPBELLI FILHOL, 1885, FROM PERSEVERANCE HARBOUR, CAMPBELL ISLAND (DECAPODA: PAGURIDAE). Royal Society of New Zealand. Journal, Dec. 1971 1(3/4), p.187-196, 13 refs.
Q1.R7
The 4 zoea larval stages of Pagurus campbelli Filhol, 1885, are described, and morphological characters of the species are compared with those of other pagurid larvae. The larvae do not fit into the groups described by previous authors. They are unique in having 2 setae on the antennal endopod in the first stage, but none in this position in the second stage. Other species have either 2 setae, or none, in both stages.

B-11202
Fineran, B.A.
CATALOGUE OF BRYOPHYTES, LICHENS AND FUNGI COLLECTED ON THE AUCKLAND ISLANDS. Royal Society of New Zealand. Journal, Dec. 1971 1(3/4), p.215-229, 14 refs.
Q1.R7
An annotated list of bryophytes, lichens, and fungi collected in the environs of Port Ross, Auckland Is., New Zealand Subantarctic region during Jan. and Feb. 1966 is presented. The catalog comprises 5 fungi, 116 lichens, 63 hepatics, and 43 mosses. New records include 3 fungi, 11 hepatics, 9 mosses and most of the lichens.

B-11203
Ponder, W.F.
REVIEW OF THE NEW ZEALAND RECENT AND FOSSIL SPECIES OF BUCCINULUM DESHAYES (MOLLUSCA: NEOGASTROPODA: BUCCINIDAE). Royal Society of New Zealand. Journal, Dec. 1971 1(3/4), p.231-283, 28 refs.
Q1.R7
The recent and fossil New Zealand species of Buccinulum are reviewed and the variation and polymorphism within many of the species are discussed. The total number of Recent and fossil Buccinulum species and subspecies in usage at the time of writing is 49, of which 24 species and subspecies are recognized and discussed here. The supspecies Buccinulum vittatum littorinoides (Reeve) found in the Cook Strait area, around the South Island and Stewart I., and at Campbell, Auckland, Antipodes, and the Snares Is., is described and compared with other subspecies.

B-11205
Clarke, M.R.
NEW TECHNIQUE FOR THE STUDY OF SPERM WHALE MIGRATION. Nature, Aug. 18, 1972 238(5364), p.405-406, 13 refs.
Q1.N2
The study of food remnants in sperm whale stomachs is proposed as a new method for the study of sperm whale migration. The main food of sperm whales in the areas studies (the Antarctic, Durban and Donkergat, South Africa, and western Australia) is cephalopod. Although cephalopod flesh is quickly digested by the whale, the chitinous jaws or beaks are retained in the second stomach and are, apparently, vomited periodically, as they are seldom found in the gut below that point. From studies on the flesh remains, it has proved possible to distinguish between cold water Antarctic cephalopods and those from temperate waters off Africa and Australia. Lower beaks from identified specimens have provided criteria for the identification of ingested lower beaks. Of twenty-nine male sperm whales examined at Durban, 17 per cent had no Antarctic cephalopod beaks. In 50 per cent of those with Antarctic beaks they contributed 1.7 per cent or less of all lower beaks. Males 35 feet or less in length had few or no Antarctic beaks, although in 60 per cent of those over 37 feet Antarctic species contributed more than 9 per cent of all lower beaks in each whale. This supports the observations that males less than 35 feet long do not normally go into Antarctic waters, and suggests that one male of only 37 feet did go far south. The beak method has considerable potential for studying migration to and from Antarctic waters, but its extension to other areas and its use in the study of smaller scale movements rest upon a more detailed knowledge of cephalopod distribution.

B-11206
McDowall, R.M.
FISHES OF THE FAMILY APLOCHITONIDAE. Royal Society of New Zealand. Journal, May 1971 1(1), p.31-52, Numerous refs.
Q1.R7
Diagnoses of the family Aplochitonidae and its two genera, Aplochiton and Lovettia are presented with descriptions of two species of Aplochiton (A. zebra Jenyns and A. taeniatus Jenyns) and the single species of Lovettia (L. sealii (Johnston)). Current knowledge of life histories and habits of these fishes is reviewed and distribution patterns are discussed. Aplochiton Jenyns is found in the South American region -- Chile, Patagonia, Tierra del Fuego, and the Falkland Is.; Lovettia McCulloch is a monotypic genus found in Tasmania.

B-11207
HOW DOES A PENGUIN ENDURE THE COLD?. Kak perenosit pingvin kholod?. Nauka i zhizn', May 1972 No.5, p.52-53, In Russian.
Q4.N43
Biological experiments carried out by the U.S. at Palmer Station on penguins and cormorants to determine behavior, physiology and changes in the cardiovascular system and in blood during various conditions are briefly described. Further studies are suggested to continue accumulating additional knowledge on the Antarctic fauna, including seals and fish lacking hemoglobin.

B-11210
Stevens, G.R.
RELATIONSHIP OF ISOTOPIC TEMPERATURES AND FAUNAL REALMS TO JURASSIC-CRETACEOUS PALEOGEOGRAPHY, PARTICULARLY OF THE SOUTH-WEST PACIFIC. Royal Society of New Zealand. Journal, Aug. 1971 1(2), p.145-158, 103 refs.
Q1.R7
Two major faunal realms, Boreal and Tethyan, may be recognized in Jurassic and Cretaceous macro-faunas. In the Jurassic, Boreal faunas populated the countries adjacent to the modern Arctic Ocean and penetrated southwards to about 50 deg N. Tethyan faunas populated the

Mediterranean and Indo-Pacific regions and penetrated as far south as 75 deg S. Continental drift, faunal, and isotope studies suggest that, in the Jurassic, Boreal faunas were related to a cool-temperate climatic zone, developed adjacent to the Jurassic North Pole, and Tethyan faunas to a tropical and subtropical zone. A Southern Hemisphere equivalent of the Boreal Realm is not evident in the Jurassic, suggesting that at this time the Southern Hemisphere continents were grouped away from the South Pole. In the Cretaceous, a Boreal Realm can be distinguished, similar in geographic extent, and climatically to the Jurassic Boreal Realm. But the Cretaceous Tethyan Realm again probably populated by tropical or subtropical stenothermal animals, had contracted considerably, and in the South Pacific region, an Austral Realm, including Australasia, West Antarctica, and South America, became differentiated. Continental drift, faunal, and isotopic studies suggest that the Austral faunas were related to a cool-temperate climatic zone and that their differentiation was related to the fragmentation of Gondwanaland and subsequent southwards drift of the Southern Hemisphere continents.

B-11213
Large, E.
MICROBIOLOGICAL INVESTIGATIONS IN THE KERGUELEN ISLANDS. Recherches microbiologiques aux Îles Kerguelen. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Oct.-Dec. 1969 No. 49, p.3-10, In French.
G845.F7

Since 1965 France has been conducting microbiological research in the waters around the Kerguelen Islands. It has been determined that an inverse relationship exists between the amount of atmospheric ozone and the bacterial population of these waters. Also, while the bacteria in various types of birds differ, the fish in the area all host the same bacterial types. During studies of bacteria pollution of Morbihan Bay, Coliforms and Escherichia coli were located in the water and Coliforms in the sediments; there was no evidence of Enterococcus. The Morbihan Bay biotope was found to prevail throughout the year. The results of an investigation on arborvirus were negative and indicated that penguins were not infected. Additional results of past research are being readied for publication. Continuing studies through 1971 will examine the effect of ozone on the genetics of microorganisms.

B-11222
Redon F., J.
NEW ASSOCIATION OF MUSCICOLOUS LICHENS OF THE WESTERN ANTARCTIC WITH SPHAEROPHORUS TENER LAUR AS A CHARACTERISTIC SPECIES. Nueva asociacion de liquenes muscicolas de la Antartica occidental, con Sphaerophorus tener Laur, como especies caracterizante. Instituto Antartico Chileno. Boletin, 1969 No.4, p.5-11, In Spanish. 10 refs.

During 1965-1966 the phytosociology of a new muscicolous association on Nelson and Galindez Islands was studied. Fresh water in potholes from melted snow provides the basis for symbiosis of algae, lichens, and mosses. Fruticulose flora predominated (75 per cent), Sphaerophorus tener Laur being the major component. Crustose (16 per cent) and semifruticulose (9 per cent) lichens completed the community. No foliaceous lichens were found. The lichens are ornithocoprophilous, the most important birds being giant petrels and skuas. During winter the community lies dormant under the snow.

B-11262
Clarke, G.C.S. , Greene, S.W.
REPRODUCTIVE PERFORMANCE OF TWO SPECIES OF POHLIA AT WIDELY SEPARATED STATIONS. British Bryolcgical Society. Transactions, 1970 6(1), p.114-128, 14 refs.
QK534.B82

The reproductive phenology of two moss species, Pohlia nutans and P. cruda, has been investigated at three sites on their bipolar ranges, these occurring in an Arctic, a temperate and a sub-Antarctic environment. The paroecious P. nutans produces sporophytes freely in all three areas, but sporophyte maturation on Disko I., West Greenland, is twice as rapid as in Britain or on the subantarctic island of South Georgia. The start of the growing season, and hence gametangial production, is considerably later in the year at both polar sites, but once produced, the gametangia mature more quickly. The dioecious P. Cruda, on the other hand, while producing sporophytes fairly freely on Disko I., is less common in fruit in Britain, and only extremely rarely so on South Georgia. Sporophytes develop more slowly in Britain than in West Greenland. Gametangial development is similar to P. nutans in that the production of sex organs is delayed by the long winter although their development is more rapid than in Britain. The maturation of gametangia of P. cruda on South Georgia is quite anomalous, a clear seasonal cycle was not observed, and a large proportion aborted.

B-11263
Clarke, G.C.S. , Greene, S.W.
REPRODUCTIVE PERFORMANCE OF TWO SPECIES OF POHLIA FROM TEMPERATE AND SUB-ANTARCTIC STATIONS UNDER CONTROLLED ENVIRONMENTAL CONDITIONS. British Bryological Society. Transactions, 1971 6(2), p.278-295, 11 refs.
QK534.B82

Samples of Pohlia nutans and P. cruda collected in Great Britain and in South Georgia have been grown under a range of environmental conditions to investigate their reproductive performance in different temperatures and day-lengths. British specimens of both species were able to complete gametangial maturation in long or short days, but South Georgian plants matured only in the former whereas short days induced gametangial abortion before dehiscence could occur. The length of the maturation cycle of P. nutans varied extensively with temperature, but little deviation from the annual field cycle was shown by P. cruda. P. Nutans was also able to mature in warmer temperatures than P. cruda in which temperature tolerance was comparatively restricted. There was also evidence of a lower temperature optimum for maturation in South Georgian than in British plants and of a lower frost tolerance in the temperate plants. This implies different types of adaptation in local populations to climatic conditions at their site of origin.

B-11268
Mabry, M.T.
DIVING UNDER THE ICE. Sea frontiers, May-June 1972 18(3), p.130-137
GC1.S4

Scientists of the U.S. Antarctic Research Program at McMurdo Station have been using scuba diving techniques to gain access to the seafloor through Weddell seal holes to obtain data on marine benthos. In the Ross Island area,

sponges, hydroids, sea anemones and alcyonarian coral colonies are abundant. Large numbers of invertebrates are found among the rocks and sponges. Ectoprocts, a highly successful phylum, are also abundant in the Antarctic. Notothenioid fishes, native to Antarctica, make up 95 percent of the fish population although other fish live below the scuba diving depth range. Species diversity is not great but the Antarctic benthic region is probably as rich in life as most tropical areas and nitrate- and phosphate-rich waters support gigantic blooms of diatoms during the summer when the ice breaks up and light penetrates the sea.

B-11269
Ainley, D.G.
FLOCKING IN ADELIE PENGUINS. Ibis, July 1972 114(3), p.388-390, 11 refs.
QL671.I12

Flocking observations made between Oct. and Feb. 1968-69 and 1969-70 at Cape Crozier included the study of spacing behavior. Measurements were made in millimeters between centers of backs for prone birds and centers of heads for upright ones. Results are expressed in units of body-width, equaling the distance between flanks. Adelies on adjacent nests average 3.8 body widths between their centers. When resting on ice or terrain they form globular shaped flocks in which they maintain 3.3 body widths between centers (Settled Distance). While porpoising they maintain a little more space, but flocks bathing and resting on the water surface appear to be spaced much as resting flocks on land. Flock cohesion and synchrony seem to be maintained by visual cues and Aark Calls. In the face of danger, i.e., predators, Adelies bunch closer than Settled Distance, reducing the spacing to approx 1.4 body widths. Unlike adults, neither flocking nor responses to predators at sea are exhibited by Adelie fledglings in spite of their well-developed response to aerial predators as chicks in creches. Flocking in Adelie Penguins may be partially a learned behavior.

B-11277
Bahamonde, N. , Moreno, C.
TROPHIC RELATIONSHIP BETWEEN NOTOTHENIA ROSSII MARMORATA FISCHER AND NOTOTHENIA CORIICEPS NEGLECTA NYBELIN FROM CHILE BAY, CHILEAN ANTARCTIC. Relaciones tróficas en Nototheria rossii marmorata Fischer and Nototheria coriiceps neglecta Nybelin; de Bahía Chile, Antártica Chilena. Instituto Antártico Chileno. Boletín, 1970 No.5, p.3-10, In Spanish. 8 refs.

Antarctic fish are primarily Nototheniformes and, more specifically, Nototheniidae. N. rossii marmorata and N. coriiceps neglecta abound in the South Shetlands. The 24th Chilean Antarctic Expedition (1969-1970) collected 125 of these fish with hooks and nets. N. coriiceps neglecta eats mostly gastropoda, amphipoda, and Thaliacea; N. rossii marmorata prefers Euphausiacea, so the two fish can coexist without major food competition. No sexual differences in eating habits were found. A table showing the number of each type of animal in the stomachs of the fish examined is given.

B-11278
Schlatter, R. , Hermosilla R., W., Castri, F. di, Covarrubias, R.
ECOLOGICAL STUDIES ON ROBERT ISLAND (SOUTH SHETLAND): EFFECT OF MICROCLIMATIC FILTERS ON THE DENSITY OF MUSCICOLINE ARTHROPODS IN ANTARCTICA. Estudios ecologicos en Isla Robert (Shetland del Sur): Efecto de filtros microclimaticos sobre la densidad de Artropodos Muscicolas en la Antartica. Instituto Antartico Chileno. Boletin, 1970 No.5, p.11-16, 9 refs.

Photoperiodicity is one of the most peculiar factors effecting the Antarctic terrestrial biosphere. Its effect on muscicoline arthropods was studied at Robert Island, where the moss mat, composed principally of Pogonatum alpinum, is large and homogeneous. The zone studied was an isothermal tundra and the habitat a Bryosystem. The test results were complicated by the significant changes in the other microclimatic conditions caused by the boxes used to cut off the light. Temperatures were higher and humidity remained near 100 percent under the boxes, creating abnormally favorable conditions for the arthropods. Whatever the effect of sunlight, temperature and humidity seemed to be the controlling factors, since density increased under the boxes. 98.5 percent of the arthropods were Cryptopygus antarcticus.

B-11280
Hermosilla R., W.
CONSERVATION OF LIVING RESOURCES IN ANTARCTICA. Conservación de los recursos vivos en la Antártica. Instituto Antártico Chileno. Boletín, 1970 No.5, p.19-20

The emphasis of the Antarctic Treaty is on the protection of living resources; the necessity for studying these resources was realized during the IGY. Recent years have seen even greater emphasis on the peaceful and cooperative use of Antarctica and on the need to avoid upsetting the environment by harming indigenous life forms or introducing new ones. This spirit of cooperation and preservation of the environment could be an example for the world.

B-11284
Orrego G., C. , Campusano L., C.
ECOLOGICAL INVESTIGATIONS ON ROBERT ISLAND (SOUTH SHETLAND IS.). Investigaciones ecológicas en Isla Robert (Shetland del Sur). Instituto Antártico Chileno. Boletín, 1970 No.5, p.40-41

Arthropods in the moss cover on Robert Island were studied in relation to repopulation of four soil types (brown, red, black, grey) that were artificially introduced and mixed with feces, humus, or withered leaves. Nesting and development of four birds (Oceanites oceanicus exasperatus, Catharacta skua lonbergi, Sterna vittata gaini, Larus dominicanus) were examined. Temperature readings of the nests and soil samples were made simultaneously four times a day to permit correlation of data.

B-11286
Waalwork, J.A.
ON THE GENUS TOTOBATES HAMMER 1961 (ACARINA: ORIBATIDAE). Pacific insects, Dec. 30, 1964 6(4), p.741-746, 5 refs.
QL461.P2

A description is given of Totobates elegans (Hammer) ssp. antarcticus n. ssp. from Campbell Island. The genus Totobates is defined and its systematic position is discussed. It is concluded that the genus belongs in the family Haplozetidae and is related to the genera Tuxenia Ham., Maculobates Ham. and Protoribates Berlese.

B-11315
Burkholder, P.R., Burkholder, L.M., Capurro, L.R.A., Asterita, H., Bach, F., Centeno, P., Asensi, A.
PRODUCTIVITY OF PHYTOPLANKTON IN THE REGION OF TIERRA DEL FUEGO AND THE SHETLAND ISLANDS. Columbia University, Lamont Geological Observatory, n.d., 36p., Unpublished manuscript. 16 refs.

Studies on the marine phytoplankton of waters in the region of the Antarctic Peninsula and Tierra del Fuego were carried out with Argentine research vessels during the months of January, February, and March in 1963 and 1964. The studies were undertaken for the purpose of obtaining more information in support of other investigations carried out on the San Martin and the Eltanin. Special efforts were made to gather information on the productivity of shallow waters located near land so that comparisons could be made with the ocean stations considered in various surveys of productivity in Antarctica.

B-11316
Horne, A.J.
ECOLOGY OF NITROGEN FIXATION ON SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.1-18, 35 refs.
QH84.2.B72

Rates of biological nitrogen fixation were determined using the N-15 technique in a variety of habitats on Signy I. The biomass of the principal nitrogen-fixing organisms, Nostoc commune and Collema pulposum, was also determined. It ranged from 28 mg. Nostoc - N per sq m and 13 mg. Collema - N per sq m in algae-rich sites to 4.5 mg. Nostoc - N per sq m and 2.9 mg. Collema - N per sq m in algae- and lichen-poor moraine areas. From these determinations it is estimated that Nostoc and Collema may together fix up to 2.1 mg. N per sq m per yr. in the more favorable sites, which were bare, wet solifluction areas on gentle south-facing slopes influenced by basic rocks and supplied with melt water of pH 8 to 9 by large snow banks. Low temperatures and desiccation both severely limited nitrogen fixation. Evidence of nitrogen deficiency was found in Nostoc, in which the nitrogen content was sometimes as low as 0.5-0.6 per cent of the dry weight. Fixation of nitrogen by fresh-water phytoplankton or benthos was negligible compared with that in wet flushes and soils.

B-11317
Ling, J.K.
VIBRISSA FOLLICLES OF THE ROSS SEAL. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.19-24, 14 refs.
QH84.2.B72

Ommatophoca rossi has between 15 and 17 mystacial vibrissa follicles on each side of the snout. The tactile hairs are short (10-40 mm in length), round in cross-section and smooth in outline. The follicles are up to 18 mm deep and are lodged in the facial musculature. Their gross and microscopic anatomy is essentially similar to that of Mirounga leonina but they are stouter and have more extensive gland complexes. The significance of these structural similarities and differences is discussed in relation to the probable sensory role of the vibrissae.

B-11319
White, M.G., Bone, D.G.
INTERRELATIONSHIP OF HYPERIA GALBA (CRUSTACEA, AMPHIPODA) AND DESMONEMA GAUDICHAUDI (SCYPHOMEDUSAE, SEMAEOSTOMAE) FROM THE ANTARCTIC. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.39-49, 46 refs.
QH84.2.B72

This paper records the first observation of the parasitic association between the cosmopolitan amphipod Hyperia galba and the Antarctic scyphomedusan Desmonema gaudichaudi. Specimens were collected at Signy I., South Orkney Is, where the host, which at times exceeds diameters of 1.2m, was most frequent by noted under pack ice in spring. Both benthic and pelagic feedings of the jellyfish were observed. Ectoparasitic adult and adolescent stages of H. galba were found on the subumbrella around the manubrium of the scyphomedusan and were shown to feed on the epidermal tissues. Endoparasitic newly released instars, which lack eye pigment and functional swimming appendages, and instars up to 6 mm long, were found in the terminal ramifications of the gastrovascular system of the host. This supports the view that hyperiids with anamorphic larval development are obligative parasites and explains the absence of free-swimming young instars from the pelagic ecosystem. Egg numbers in hyperiids are high, particularly in this Antarctic population, and this may be related to the parasitic mode of life to offset high mortalities at infection of the host and emigration to new hosts. The population structure is bimodal and some form of alternation of generations could be responsible, although more sampling is required to confirm this and the timing of the reproductive cycle.

B-11320
Longton, R.E.
REPRODUCTION OF ATARCTIC MOSSES IN THE GENERA POLYTRICHUM AND PSILOPILUM WITH PARTICULAR REFERENCE TO TEMPERATURE. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.51-96, 38 refs.
QH84.2.B72

The reproductive capacity of the Polytricha was investigated with relationship to temperature at sites between the Falkland Is. and Marguerite Bay, Antarctic Peninsula. Fruiting was widespread in Polytrichum alpestre and P. piliferum on the Falkland Is. and in these species and P. alpinum, P. juniperinum and Psilopilum antarcticum in the sheltered north-east coastal lowlands of South Georgia. The frequency of sporophytes may decline in some species, notably P. alpinum, at high altitudes and on more exposed coasts of South Georgia, while reproductive success in all five species was drastically reduced in the maritime Antarctic where widely scattered fruiting colonies of only P. alpestre and P. alpinum were recorded. Moreover, many of the occasional sporophytes at the Atarctic sites were small, aborted, or abnormally shaped and incompletely differentiated, and spores were recorded only in P. alpinum on Lynch I. A sixth species, Psilopilum tapes, occurred only rarely at scattered sites on South Georgia; one fruiting specimen was examined. It was concluded that both the timing and efficiency of the sexual reproductive process in the Polytrichaceae varies widely under climatically different conditions in southern polar regions, and that rapid successful development is apparently related to temperature in the actively growing surface layer of the turf.

B-11322
Bone, D.G.
ASPECTS OF THE BIOLOGY OF THE ANTARCTIC AMPHIPOD BOVALLIA GIGANTEA PFEFFER AT SIGNY ISLAND,

SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.105-122, 18 refs.
QH84.2.B72

Aspects of the biology and ecology of Bovallia gigantea Pfeffer have been investigated, some for the first time and others to confirm earlier work. Studies of habitat and food-supply indicate that shelter plays a large part in determining distribution . Gut contents show that B. gigantea is a predator/omnivore. Food supply is found to have a greater effect on growth rate than temperature and it is thought to be partly responsible for the long marsupial development time, advantage being taken of a summer maximum to provide food for young and developing oocytes. It is shown that growth rates vary between year groups but the causes are not evident. Growth factors are discussed and a possible regime is suggested. Gonad histology shows that males can breed for the first time at age 18 mo and females at 40-42 mo. The number of broods is not finite, oostegite morphology providing further evidence for the thesis that more than one brood can be produced. Predation upon, and parasitism of, the species is discussed.

B-11323
Baker, J.H.
RATE OF PRODUCTION AND DECOMPOSITION CHORISODONTIUM ACIPHYLLUM (HOOK. F. AND WILS.) BROTH.. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.123-129, 20 refs.
QH84.2.B72

Net annual production of a peat-forming moss, Chorisodontium aciphyllum, on Signy I. has been calculated to be 436 g/sq m/yr. The method involved the use of crank-shaped markers from which vertical growth was measured. Three methods have been used to determine the rate of decomposition of the same moss. The decomposition rate appears to have been approximately linear for a number of years, averaging only 2 per cent each year. Several hypotheses are advanced concerning the low rate of decomposition and consequent development of peat.

B-11324
Brook, D. , Beck, J.R.
ANTARCTIC PETRELS, SNOW PETRELS AND SOUTH SKUAS BREEDING IN THE THERON MOUNTAINS. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.131-137, 23 refs.
QH84.2.B72

Observations made in the Theron Mountains in 1966-67 and 1966-68 revealed the presence of a large breeding colony of Antarctic petrels on Mount Faraway. This colony is only the ninth to have been discovered and it is probably the most southerly breeding area known for any bird species. Small numbers of snow petrels and south polar skuas were also breeding in the mountains.

B-11325
White, M.G.
DESCRIPTIVE AND BIOLOGICAL NOTES ON THE RARE ANTARCTIC ISOPOD SEROLIS OVATA SHEPPARD (CRUSTACEA: FLABELLIFERA). British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.139-144, 12 refs.
QH84.2.B72

Sheppard's description of Serolis ovata is augmented with details of the mature male and female. The color of live specimens is recorded and an increase in sculpturing of the exoskeleton with increase in size noted. The species has been found on gravel substrates from the littoral to 21 m at Signy I., South Orkney Is, usually associated with S. polita. Stomach contents suggest that it is an active predator. Evidence of a reproductive cycle is capable of ambiguous interpretation.

B-11346
Abe, T. , Hoshiai, T.
COLLECTION OF FISHES FROM SYOWA STATION, ANTARCTICA. Antarctic record, March 1972 No.43, p.25-30, 6 refs.

With the exception of one species, all the fishes in a collection caught near the coast of Showa Station during the years 1961 through 1970, belong to the family Nototheniidae, representing eight species. The list of Nototheniidae includes Trematomus bernacchii Boulenger, T. vicarius Lonnberg, T. newnesi Boulenger, T. nicolai (Boulenger), T. borchgrevinki (Boulenger), T. hansoni Boulenger, T. centronotus Regan, and Trematomus sp. The collection also includes one specimen of Gymnodraco acuticeps Boulenger, belonging to the family Bathydraconidae.

B-11360
Permitin, IU.E.
NEW DATA ON THE COMPOSTION AND DISTRIBUTION OF FISHES IN THE SCOTIA SEA (REPORT NO.2). Novye dannye o vidovom sostave i rasprostranenii ryb moria Skotiia (Skosha) v Antarktike (Soobshchenie vtoroe). Voprosy ikhtiologii, 1969 9(2(55)), p.221-239, In Russian. 26 refs.
QL614.V6

As a result of studies carried out aboard the Akademik Knipovich in the Scotia Sea in 1967, in addition to the previously known 13 species (see: B-6130), 11 species and 8 families were found. These species new to the area include two new species, Lycenchelys bellingshauseni and L. aratrirostris. The occurrence of some fishes of subtropic and subantarctic origin in the Scotia Sea indicates that the highly productive krill zone is a feeding area not only for whales, pinnipeds and birds, but also for fishes.

B-11361
Parin, N.V. , Permitin, IU.E.
PELAGIC ICHTHYOFAUNA OF THE ANTARCTIC: A NEW GENUS OF STROMATEOID FISH--PSEUDOICICHTHYS (PISCES, CENTROLOPHIDAE). K poznaniiu pelagicheskoi ikhtiofauny Antarktiki: novyi rod stromateevidnykh ryb -- Pseudoicichthys (Pisces, Centrolophidae). Voprosy ikhtiologii, 1969 9(6(59)), p.981-987, In RUssian. 9 refs.
QL614.V6

The new genus Pseudoicichthys resembles Icichthys and Centrolophus, but differs because of the highly developed squamous head cover, structure of the supra- and retro-orbital pores of the seismosensory system, numerous ramulose pyloric appendices and some osteological features. P. australis occurs in subantarctic and antarctic waters, however, only immature, large-size specimens were found S of the Antarctic Convergence.

B-11362
Jakubowski, M.
MORPHOLOGY OF THE LATERAL ORGANS IN FISHES BELONGING TO THE ANTARCTIC GENUS TREMATOMUS BOUL. (NOTOTHENIIDAE, PISCES). Osobennosti morfologii sistemy organov bokovoi linii u predstavitelei antarkticheskogo roda

Trematomus Boul. (Nototheniidae, Pisces). Voprosy ikhtiologii, 1970 10(2(61)), p.385-390, In Russian. 11 refs.
QL614.V6

The structure of the lateral line canals in the head of the genus Trematomus Boul. found in antarctic waters is described and illustrated. Two main types were distinguished in 13 endemic species. The first type is characterized by uninterrupted canals in 8 species interrupted canals in 3 species in the head. Along with an interruption in the supratemporal commissure, either the suborbital and pretegmen-mandibular canals or the suborbital canal only may be interrupted. The second type includes 2 species with strongly reduced canals both in the head and trunk. This type lacks the coronary commissure and, due to interruptions in the suborbital canals, two segments of the canal and suborbital ossicles are lacking. The pretegmen canal in the second-type species contains one segment less, than in the first.

B-11363
IUkhov, V.L.
STRUCTURE OF OTOLITHS IN THE ANTARCTIC AND PATAGONIAN TOOTHFISHES DISSOSTICHUS MAWSONI NORM. AND D. ELEGINOIDES SMITT IN THE SOUTHERN OCEAN. Stroenie otolitov antarkticheskogo i patagonskogo klykachei Dissostichus mawsoni Norm. i D. eleginoides Smitt IUzhnogo okeana. Voprosy ikhtiologii, 1971 11(4(69)), p.587-594, In Russian. 5 refs.
QL614.V6

The otoliths obtained from collections of the antarctic and Patagonian male and female toothfishes Dissostichus were studied at the Azov-Black Sea Scientific Research Institute of Salt Water Fishery and Oceanography in Odessa. The results show distinctive features of otolith structure in different species. The data can be used to distinguish sex and species, if no other determinatives are available.

B-11364
Jakubowski, M.
MORPHOLOGICAL FEATURES OF THE LATERAL ORGANS IN FISHES BELONGING TO THE GENUS NOTOTHENIA RICHARDSON AND OTHER GENERA OF THE FAMILY NOTOTHENIIDAE (PISCES). Morfologicheskie osobennosti sistemy organov bokovci linii u predstavitelei roda Notothenia Rich. i drugikh rodov semeistva Nototheniidae (Pisces). Voprosy ikhtiologii, 1971 11(4(69)), p.595-601, In Russian. 13 refs.
QL614.V6

The anatomic structure of the lateral canals in the head and forepart of the dorsum of the family Nototheniidae was studied in: 21 genera of Notothenia, 2 genera of Dissostichus, one genus of Aethotaxis, one genus of Pleuragramma, one genus of Eleginops, 11 genera of Trematomus, and 2 genera of Pagothenia. Special attention was paid to the complex genus Notothenia, in which two main types were distinguished on the basis of the head-canal structure. The structure of canals is evendently different in the antarctic and Patagonia-Falkland (strictly notal) species.

B-11365
Andriiashev, A.P. , Jakubowski, M.
MORPHOLOGICAL GROUNDS FOR GENERIC SEPARATION OF THE ANTARCTIC BROAD-HEAD FISHES TREMATOMUS BORCHGREVINKI BOULENGER AND T. BRACHYSOMA PAPPENHEIM) AND A NEW STATUS OF THE GENUS PAGOTHENIA NICHOLS ET LAMONTE (NOTOTHENIIDAE). Morfologicheskoe obosnovanie rodovogo obosobleniia antarkticheskikh shirokolobikov (Trematomus borchgrevinki Boulenger i T. brachysoma Pappenheim) i novyi status roda Pagothenia Nichols et Lamonte Nototheniidae. Zoologicheskii zhurnal, July 1971 50(7), p.1041-1055, In Russian with English summary. 26 refs.
QL1.Z747

Morphology of the lateral organs in the antarctic broadhead-fishes was studied and generic differences, compared with other nototheniids, was ascertained. Study of the syntypes of Trematomus brachysoma from Pappenheim's collection (Berlin), has shown that its species identify with the previously described doubtful form Pagothenia antarctica from the Ross Sea. A new description is given for the genus Pagothenia which now consists of two cryopelagic species: P. brachysoma and P. borchgrevinki. (Auth.)

B-11366
Ivashin, M.V.
RESULTS OF WHALE MARKING BY SOVIET SHIPS IN THE SOUTHERN HEMISPHERE. Nekotorye rezul'taty mecheniia kitov, provedennogo s sovetskikh sudov v IUzhnom polusharii. Zoologicheskii zhurnal, July 1971 50(7), p.1063-1078, In Russian with English summary. 19 refs.
QL1.Z747

In 1952-1970 Soviet explorers had marked 1651 whales, of which 1141 were in the southern parts of the Indian and Atlantic Oceans. Humpback (530), sperm (461) and fin whales (363) were most numerous. The return of 134 Soviet marks was registered: 2 from blue, 41 from fin, 15 from sei, 62 from humpback and 14 from sperm whales. The maximal duration of the body mark did not exceed 10 years. In the regions of feeding the marked whales returned most often near the place of marking. In some cases the whales migrated over long distances (finwhales, and less often humpback and sei whales). Migrations from the regions of feeding (Antarctica) to the regions of hibernation (moderate and warm waters) were registered in fin, sei, humpback and sperm whales. The occurence of whales in definite regions of feeding suggests the existence of several local whale populations in the Southern Hemisphere.

B-11372
Harper, P.C.
FIELD IDENTIFICATION AND DISTRIBUTION OF THE THIN-BILLED PRION (PACHYPTILA BELCHERI) AND THE ANTARCTIC PRION (PACHYPTILA DESOLATA). Notornis, June 1972 19(2). p.140-175, 42 refs.
QL671.N65

The field characters of both the Thin-billed Prion (Pachyptila belcheri (Mathews, 1912)) and the Antarctic Prion (P. desolata banksi (Smith, 1840) and P.d. alter (Mathews, 1912)) are described and a discussion of the differing feeding habits and food is given. The food of Pachyptila belcheri chiefly consists of the amphipod Parathemisto gaudichaudii which is taken nocturnally, while the "krill" Euphausia superba is the primary food source of P. desolata and is mainly captured by day. The Thin-billed Prion ranges far from its known breeding grounds at the Falkland I. and Kerguelen, and is the most frequently encountered Pachyptila in the southernmost waters of the central Pacific. Birds of the year reach the Bellingshausen Sea from the Falkland Is. by mid-Apr. and disperse over much of the South Pacific during May. In early Nov. sub-mature birds gather in substantial numbers south of the Antarctic Convergence to take advantage of a rich

food supply and undergo an early moult in Dec. and Ja. The adults apparently begin the moult cycle in early Feb. and are through by May. The distribution of both species of prion is discussed on the basis of field work and specimen records, and an attempt has been made to correlate this data with published information. A tentative distributional pattern for both species is presented. (Auth.)

B-11374
Voronina, N.M.
SPATIAL STRUCTURE OF INTERZONAL COPEPOD POPULATIONS IN THE SOUTHERN OCEAN. Marine biology, Aug. 1972 15(4), p.336-343, 17 refs.
QH91.A1M35

The vertical distributions of Calanoides acutus, Calanus propinquus and Rhincalanus gigas have been studied during Cruises I and II of the Ob in the Indian sector of the Southern Ocean. During the spawning period, all 3 species reveal the highest concentrations, and occupy the highest positions in the water column. During the period of feeding and growth, they begin slowly to disperse and to descend to greater depths. In spring, the populations ascend again to the water surface. In both seasons, later stages migrate first. Pronounced temperature gradients may prevent the ascent, and result in the breeding and subsequent growth of the new generation occurring in subsurface waters. Details of the vertical distributions of populations depend on their seasonal state and the local hydrology. (Auth.)

B-11376
Sokolova, M.N.
TROPHIC STRUCTURE OF DEEP-SEA MACROBENTHOS. Marine biology, Sept. 1972 16(1), p.1-12, 50 refs.
QH91.A1M35

The effect of the trophic factor on large-scale distributional patterns of deep-sea macrobenthos inhabiting the floor of the World Ocean has been studied. Two hundred and twenty-eight bottom trawl samples collected by Soviet research vessels in the Pacific and Indian Oceans, including antarctic waters, at depths ranging from 3000 to 6000 m were analyzed. Eutrophic and oligotrophic regions on the floor of the World Ocean have been distinguished and their boundaries defined. Eutrophic regions lie within areas with high biological productivity of surface-water layers, and cover the peripheral and equatorial parts of the oceans; they are characterized by quantities of labile (digestible) organic matter within sediments which are sufficient for deposit-feeders to predominate in eutrophic regions everywhere, except on considerable bottom elevations. Oligotrophic regions are confined to open areas of the oceans lying beyond the equatorial belt; they are characterized by very low rates of sedimentation and, consequently, by scarse quantities of deposited organic matter. Here, suspension-feeders predominate, although their population density is very low.

B-11380
Walsh, J.J.
VERTICAL DISTRIBUTION OF PHYTOPLANKTON IN THE WATERS AROUND PALMER PENINSULA, ANTARCTICA. Coral Gables, University of Miami, Jan. 1968, 162p., Masters thesis. Refs. p. 61-71

An examination of the qualitative and quantitative vertical distribution of the phytoplankton in the waters around Palmer Peninsula, Antarctica, was made during Jan.-Feb. 1966 aboard the Eastwind. The distribution of the phytoplankton community was of a vectorial pattern effected by the external factors of the habitat. The horizontal distribution of dislodged ice micro-algae and resident phytoplankton species reflected the presence of two distinct surface currents around Palmer Peninsula. The vertical distribution of the phytoplankton community was associated with seasonal temporary stratification of the surface waters, with large scale stratification of water masses, and with downwelling water in the formation of allochthonous populations in the aphotic zone. The sediment distribution summarized the outcome of individual species interactions with the environment and represented the final export of material from the water column.

B-11381
Bandy, O.L. , Rodolfo, K.S.
DISTRIBUTION OF FORAMINIFERA AND SEDIMENTS, PERU-CHILE TRENCH AREA. Los Angeles, University of Southern California, Mar. 1964, 34p., 44 refs.

Eighteen trawl samples, one Peterson grab, and thirteen Phleger cores were collected between depth of 179 and 6250 in the Peru-Chile Trench area. Sediments are mainly olive-green silt, clay and colloidal material; however, four cores contain significant amounts of either sand-sized foraminifera or shale fragments, and one core is mainly white volcanic ash. Values for organic carbon and nitrogen are much higher in the bathyal than in the abyssal zone. Sediment grain sizes do not exhibit definite trends with either water depth or distance from shore. Calcium carbonate contents decrease sharply below 3500 m, reflecting reduced quantities of calcareous foraminifera in the Trench. Radiolarians are usually more than twice as abundant as foraminifera deeper than 1500 m. Foraminifera larger than 0.5 mm were concentrated in the trawl samples and are mainly arenaceous types below 1000 m. Among the smaller foraminifera, calcareous forms predominate down to 2000 m; at greater depths calcareous-arenaceous ratios fluctuate extremely. Tests of planktonic foraminifera are most abundant in the bathyal zone. Bathymetric foraminiferal zonation is based upon upper limits of occurrence for both the larger live foraminifera from the trawls and the smaller foraminifera from the cores. Maximum size of the larger foraminifera is usually between one and ten mm. The zonation from 179 m to 3404 m is given. (Auth.)

B-11384
Burkholder, P.R. , Pfister, R., Bach, F.
STUDIES OF BACTERIA FROM THE ANTARCTIC AND SUB-ANTARCTIC WATERS AND SEDIMENTS. Palisades, Columbia University, [1965?], 13p., Unpublished manuscript

Aerobic bacteria were studied in the American sector of Antarctica from July 1962 to June 1964 to observe the geographic distribution of bacteria at different depth and various times of the year; to determine nutritional requirements, temperature adaptations, and metabolic properties; and to make a systematic study of 160 characteristics, with special reference to principles of computer taxonomy. The bacteria appear to be in two categories: (1) those able to withstand high temperature (47C) for short periods, and (2) those requiring cold isolation procedures (greater than 10C) because of their extreme sensitivity to even moderate temperatures. The majority of isolates were Gram-rods growing at 20 deg and probably Pseudomonads because of the high incidence of cells with a

single polar flagellum, with some incidence of curved rods. Results of the tests are summarized.

B-11385
Burkholder, P.R. , Hayes, W.C.
SOME MICROBIOLOGICAL INVESTIGATIONS IN ANTARCTICA. Palisades, Columbia University, Mar. 15, 1963, 23p., Unpublished manuscript. 4 refs.

This report is concerned chiefly with observations made on Cruise 4 of the research vessel Eltanin between Valparaiso, Chile and the South Shetland Is. during the months of July and Aug. 1962. Data are included on the following studies: Phytoplankton collected from the laboratory sea water source, strained with a No. 20 net; Comparison of data obtained with the high speed sampler and by filtration of sea water in the laboratory; Chlorophyll a as an index to the standing crop of phytoplankton; Comparison of net and nanno plankton with indices of chlorophyll and C-14 fixation; Observations on phytoplankton frozen in sea ice; Primary productivity estimated with the C-14 method; Quantitative estimation of bacteria at different stations and depths; and Chemical determinations of phosphate, nitrate and silicate in Antarctic waters.

B-11386
Burkholder, P.R. , Burkholder, L.M.
STUDIES OF CHLOROPHYLL AND PRIMARY PRODUCTIVITY IN ANTARCTIC WATERS. Palisades, Columbia University, [1965?], 15p., Unpublished manuscript. 7 refs.

Phytoplankton, primary productivity and chlorophyll a of Antarctic and Sub-Antarctic waters in the region from latitude approximately 50 S to the edge of the ice and longitude 20 W to 120 W were studied during the period July 5, 1962 to Apr. 21, 1964. Samples were collected by several different field investigators on nine cruises of the Eltanin and one cruise of the Argentine research vessel Canepa. The dates and approximate locations of the cruises are shown. The data for chlorophyll and carbon fixation are presented; observations on species of plankton, bacteriology, and certain relationships of physical and chemical factors to the development of the plankton will be presented in separate publications.

B-11388
GIANT BLUE WHALE'S VOICE DETECTED BY NAVAL SCIENTISTS. Commercial fisheries review, Oct. 1970 32(10), p.14

Studies are reported on blue whale behavior during a 6-week Naval Undersea Research and Development Center expedition which departed Punta Arenas, Chile aboard the research vessel Hero. Underwater sounds were recorded of 4 blue whales, about 75 ft long, sighted near Guafo I., southern Chile. The blue whale has a strong underwater voice -- its powerful, half-minute murmur can travel over 100 mi. Two kinds of signals were noted: one lasted precisely 37 sec, including a 2-sec break. The second type lasted as long, but it exhibited two breaks, 1.5 and 3.5 sec. Most acoustic energy was at 24 cycles per sec, a murmuring sound about as low in pitch as man can hear. Blue-whale signals are much longer than those recorded from other whales and are produced at very standardized intervals. They are extremely complicated--with overtones extending pitch up to about 250 cycles per sec, about middle C on the musical scale.

B-11391
Casey, R.E.
NEOGENE RADIOLARIAN BIOSTRATIGRAPHY AND PALEOTEMPERATURES: SOUTHERN CALIFORNIA, THE EXPERIMENTAL MOHOLE, ANTARCTIC CORE E 14-8. Palaeogeography, palaeoclimatology, palaeoecology, Aug. 1972 12(1/2), p.115-130, 22 refs.
QE500.P25

Neogene radiolarians from southern California were compared to radiolarians from the Experimental Mohole and core E 14-8 from the Antarctic Ocean. An attempt to utilize the radiolarian zonation of Riedel was hampered by a sparsity of typical time-index forms in the southern California and Antarctic samples. These difficulties were partially overcome by using the Experimental Mohole to correlate Riedel's "warm" time-indices with selected "cold" time-indices from the Antarctic and southern California. Some "cold water" radiolarians useful in high-latitude correlations are Prunopyle titan, Lychnocanium grande and Theocyrtis redondoensis that drop out just below the Miocene- Pliocene boundary, and Lamprocyclas heteroporos (in the strict sense) that appears to evolve at or near the Miocene-Pliocene boundary. In high latitudes the Pliocene-pre-glacial Pleistocene boundary appears to be delineated by the extinction of L. heteroporos. Paleotemperatures, derived from radiolarian ratios, suggest large-scale synchronous warmings and coolings for the various areas studied. (Auth.)

B-11392
Kooyman, G.L. , Campbell, W.B.
HEART RATES IN FREELY DIVING WEDDELL SEALS, LEPTONYCHOTES WEDDELLI. Comparative biochemistry and physiology, Sept. 1, 1972 43(1A), p.31-36, 10 refs.
QP121.A1R4

Heart rates of seals were recorded during four activity levels; while they were sleeping in ice holes, before, during and after dives. Resting heart rates averaged 64/min during eupnea and 34/min during apnea. Rates before and after dives averaged 85/min. Rates during dives up to 5-min duration averaged 36/min. Rates during the first 45 sec of dives longer than 5 min were as low as 16/min. There appears to be an inverse relationship between heart rate and length of the dive. This relationship as well as other observed behavioral events that seem to be correlated with heart rate indicate that the seals anticipate the nature of the dive. (Auth.)

B-11395
IUkhov, V.L.
DISTRIBUTION AND SOME BIOLOGICAL FEATURES OF THE ANTARCTIC TOOTHFISH (DISSOSTICHUS MAWSONI NORMAN). Rasprostranenie i nekotorye cherty biologii antarkticheskogo klykacha (Dissostichus mawsoni Norman) Voprosy ikhtiologii, 1971 11(1(66)), p.14-25, In Russian. 13 refs.
QL614.V6

Data indicating the circum-antarctic distribution of the antarctic toothfish is based on studies of sperm-whale stomach contents. The largest concentrations of fish were found between 60 and 70 S and 105 W and 160 E, (from the Amundsen to Ross Seas). Measurements are given of size, weight, fat, sex ratio and maturity coefficient of the fish. An analysis of the stomach content of the fish shows that it feeds on small fish Pleuragramma antarcticum and squids. Histological analysis of the gonads and chemical analysis of flesh and liver can be used in determining the time and nature of spawning.

B-11396
Shuntov, V.P.
UPPER-BATHYAL FISHES OF THE NEW ZEALAND PLATEAU. Ryby verkhnei batiali novozelandskogo plato. Voprosy ikhtiologii, 1971 11(3(68)), p.427-437, In Russian. 32 refs.
QL614.V6

Results of observations of the upper-bathyal fishes of the New Zealand Plateau and Campbell Island areas in 1964-1970 show the composition and seasonal distribution of fishes. Due to the high-water dynamics, the Campbell Island area is very rich in poutassou and other fishes from moderate-temperature waters. Seasonal migration occurs along the New Zealand coast, and in the summer some fishes, especially poutassou, go to antarctic waters for fattening. Further studies in the biology and food potential of fish are suggested for use in fisheries.

B-11397
Permitin, IU.E. , Sil'ianova, Z.S.
NEW DATA ON THE REPRODUCTION AND FECUNDITY OF THE GENUS NOTETHENIA RICHARDSON IN THE SCOTIA SEA. Novye dannye po biologii razmnozheniia i plodovitosti ryb roda Notothenia Rich moria Skosha (Skotiia, Antarktika). Voprosy ikhtiologii, 1971 11(5(70)), p.806-819, In Russian. 21 refs.
QL614.V6

Studies carried out in the Scotia Sea in 1965 of 7 species of the antarctic nototheniid fish show a few species with low relative fecundity and a hundred species with high relative fecundity in the genus Notothenia. The rate of the fecundity and reproduction in the fish is considerably higher off South Georgia, than off the Shetland and Orkney Islands. The reproduction areas are located on the island shelves of the South Antilles Ridge.

B-11398
Permitin, IU.E. , Tarverdieva, M.I.
FOOD OF SOME ANTARCTIC FISHES IN THE SOUTH GEORGIA AREA. Pitanie nekotorykh vidov antarkticheskikh ryb v raione ostrova IUzhnaia Georgiia. Voprosy ikhtiologii, 1972 12(1(72)), p.120-132, In Russian. 15 refs.
QL614.V6

On the basis of the kind of food consumed, South Georgian fishes were divided into 4 groups: planktonophages, benthophages, and biophagous and euryphagous fishes. Studies of 10 species show that there is a greater degree of similarity in planktonophages than in benthophages. Krill Euphausia superba Dana was found in all fishes examined: in 6 species krill is the primary food, in 3 species, secondary and in one species, tertiary. The fullest state of the stomach was observed in some species during their fattening in the krill accumulation areas.

B-11399
IUkhov, V.L.
DISTRIBUTION OF TOOTHFISH OF THE GENUS DISSOSTICHUS (FAMILY NOTOTHENIIDAE) IN ANTARCTIC WATERS OF THE INDIAN OCEAN. O rasprostranenii klykachei roda Dissostichus (sem. Nototheniidae) v antarkticheskikh vodakh Indiiskogo okeana. Voprosy ikhtiologii, 1972 12(2(73)), p.384-385, In Russian. 7 refs.
QL614.V6

An analysis of the stomach content of the sperm whale Phyzeter catodon L. caught by the Sovetskaya Ukraina around Prince Edward, Crozet and Kerguelen Islands during Jan.-March 1971 shows that, in addition to other food, whales consume a considerable amount of the Patagonian toothfish Dissostichus eleginoides Smitt. The data reveal that D. eleginoides, from Jan. to March, is permanently located in sub-antarctic waters of the Indian Ocean between 40 and 70 E and 45 and 50 S, where the water temperature varies from 5.7 to 10.8 C. D.mawsoni Norman inhabits waters S of that area to a N boundary at about 57 S where the water temperature is from 1.8 to 2.3 C. The Antarctic Convergence is perhaps an ecological barrier which prevents the mixing of the two species.

B-11400
Tarverdieva, M.I.
DAILY RATION AND FEEDING PATTERN OF THE MARBLE NOTOTHENIA NOTOTHENIA ROSSI MARMORATA FISCHER AND THE PATAGONIAN TOOTHFISH DISSOSTICHUS ELEGINOIDES SMITT OF THE FAMILY NOTOTHENIIDAE IN THE SOUTH GEORGIA AREA. Sutochnyi ratsion i khod pitaniia mramornci nototenii Notothenia rossi marmorata Fischer i klykacha Dissostichus eleginoides Smitt (sem. Nototheniidae) v raione ostrova IUzhnaia Georgiia. Voprosy ikhtiologii, 1972 12(4(75)), p.748-756, In Russian. 19 refs.
QL614.V6

Observations carried out near South Georgia in March 1971 showed that the primary food of Notothenia rossi marmorata Fischer was jelly-combs, and that of Dissostichus eleginoides Smitt was fish. An increase in food consumption was observed in the afternoon, and a decrease in the morning. Notothenia ate intensively during 15 hours followed by a break for 13 hours, while toothfish ate for 19 hours with a break for 10 hours. In May, when Notothenia were feeding on Euphausia superba Dana, an increase in consumption occurred during 11 hours, and a decrease during about 16 hours. The feeding pattern indicated that the daily ration was about 13.9 per cent by weight of the Notothenia, and 5.1 per cent of the toothfish. Data on the composition and caloric value of food consumed in March and May, and the chemical content of krill in the South Georgia area are tabulated.

B-11401
Be, A.W.H. , Chen, C., Hillman, N., McIntyre, A.
ECOLOGY OF ANTARCTIC SKELETAL PLANKTON. Palisades, Columbia University, Dec. 1964, 23p., 12 refs.

A total of 727 plankton samples were obtained at 203 stations during Eltanin Cruises 8 to 19 between Apr. 1963 and Sept. 1964. Two phytoplankton blooms were observed. The first occurred during the greater part of Cruise 8 (fall of 1963) and the second during Cruise 11 and 12 (summer and fall of 1964). During the intervening winter and early spring of 1963 and the fall and winter of 1964, very small phytoplankton concentrations were evident. During the winter of 1963, there was little zooplankton in the upper 100 m, while abundant zooplankton was present between 250 and 1000 m depth. On the other hand, during the summer and early fall of 1964 (Cruise 11 and 12), zooplankton abundances were approximately uniform throughout the upper 1000 m. Towards the late fall of 1964 (Cruise 13), the seasonal downward migration of zooplankton was evident again as zooplankton abundances were small in the upper 100 m and correspondingly high in the 250-500 m and 500-1000 m depth ranges. This situation was observed between May and Sept. 1964 (Cruise 13 and 14). Thus the seasonal periodicity of zooplankton migration, downward during the winter

and upward during the summer, corresponds to similar observations by Foxton (1964; B-706).

B-11429
Schlee, S.
ONE SMALL STEP FOR SCIENCE, ONE GOOD MEAL FOR THE SHIP'S CAT. Natural history, Oct. 1972 81(8), p.28-31
QH1.N13

On Feb. 20, 1842, during the expedition of the Erebus and the Terror under the command of Sir James Clark Ross (in what is now known as the Ross Sea) a fish was found frozen against the bow of the Terror. After a rough sketch had been made of the fish and a description noted, the specimen was eaten by the ship's cat. The missing fish, the first ever caught in the Antarctic, was named Pagetodes, meaning frozen solid. On May 17, 1898, little more than 56 yr later, the Belgica, frozen in pack ice after crossing the Polar Circle, trawled a variety of animals, including a single small fish, preserving them in alcohol. Some 7 mo later, still frozen in, the crew of the Belgica set about opening up a channel through ice 6 ft thick with 3 small ice saws. After 1-1/2 mo of constant work they had made a 1/2 mi long channel to open water. The specimens were eventually deposited in the Brussels museum where the fish was given the scientifically acceptable name of Cryodraco antarcticus and proclaimed to be that rarest of cat foods --Pagetodes.

B-11430
Brown, W.V. , Smith, B.N.
GRASS EVOLUTION, THE KRANZ SYNDROME, C-13/C-12 RATIOS, AND CONTINENTAL DRIFT. Nature, Oct. 6, 1972 239(5371), p.345-346, 13 refs.
Q1.N2

The Kranz syndrome is a group of related anatomical, cytological and physiological characters reported in about 10 families of angiospermous plants, and it is centered around the CO2 fixation aspect of photosynthesis. In Gramineae the evolution of the syndrome seems to have occurred only two or three times early in grass evolution. The only report of Kranz and non-Kranz species within one grass genus is within Panicum where the subgenus Dichanthelium is non-Kranz whereas the more typical species of the subgenus Eupanicum are Kranz species. Recent determination of C-13/C-12 ratios of over 180 species, in 110 genera, of forty tribes of grasses, has revealed evidence of both types also among genera of the tribe Paniceae and among tribes of the subfamily Panicoideae. Furthermore, now that geology has accepted Wegenerian drifting continents and the break-up of an ancient single world-continent by rifting under the concept of plate tectonics, evolution of the Gramineae can be discussed in terms of that concept; that is, Upper Jurassic-Middle Cretaceous separation of East Gondwana (consisting of Australia and Antarctica) and the Middle to Late Cretaceous separation of South America from Africa, with the tropical belt approximately in its present relationship to the continents since Early Jurassic time.

B-11463
Pierre, J.P. , Noel, P.
HYDROBIOLOGICAL RESEARCH ON AMSTERDAM ISLAND: 1969-1970 SEASON. Recherches hydrobiologiques a l'ile Amsterdam: campagne 1969-1970. Academie et societe lorraines des sciences. Bulletin, 1971 10(2), p.101-111, In French with English summary. 6 refs.

Some freshwater biotopes of Amsterdam I. are described. Temperature and pH, and the influence of seals on a pond near the base of la Roche Godon are studied. A short list of algae is included with some ecological annotations. (Auth.)

B-11465
Stirling, I. , Greenwood, D.J.
OBSERVATIONS ON A STABILIZING POPULATION OF WEDDELL SEALS. Australian journal of zoology, May 1972 20(1), p.23-25, 10 refs.
QL1.A865

The Weddell seal population of eastern McMurdo Sound, after a period of increase and subsequent decline, is now stabilizing in terms of total numbers and pup production. Increased intrasexual strife resulting mainly from competition for access to the best pupping and breeding colonies appears to be the major factor causing stabilization. (Auth.)

B-11467
Malmgren, B. , Kennett, J.P.
BIOMETRIC ANALYSIS OF PHENOTYPIC VARIATION: GLOBIGERINA PACHYDERMA (EHRENBERG) IN THE SOUTH PACIFIC OCEAN. Micropaleontology, April 1971 18(2), p.241-248, 17 refs.

The study of phenotypic variation within planktonic foraminifera is enhanced by multivariate statistical analysis. Analysis of intrasample and intersample variation of Globigerina pachyderma in surface sediments of the southwest Pacific Ocean shows that changes in frequency and coiling direction are highly significantly related to latitude, and that sorting is significantly related to both maximum and median diameters. Four latitudinal groupings are clearly defined by principal component analysis. (Auth.)

B-11473
Kol, E.
GREEN SNOW AND ICE FROM THE ANTARCTICA. Annales historico-naturales Musei Nationalis Hungarici, 1971 63, p.51-56, 10 refs.
QH7.B92

Six green algal species from green snow and ice samples collected on Terre Adelie, Antarctica, are discussed. The predominating taxa are Bracteococcus minor var. glacialis Flint, and Chlamydomonas ballenyana var. minor var. nova. An algal diagram shows also the quantitative occurrence of the microorganisms of the cryoseston. A review and comparison of the green cryosestons hitherto published from Antarctica are also given. (Auth.)

B-11474
Samsel, G.L., Jr. , Parker, B.C.
NUTRIENT FACTORS LIMITING PRIMARY PRODUCTIVITY IN SIMULATED AND FIELD ANTARCTIC MICROECOSYSTEMS. Virginia journal of science, Summer 1972 23(2), p.64-71, 17 refs.
Q1.V5

The effects of selected nutrient enrichments on the algal communities of two closely associated Antarctic lakes were compared, both in laboratory microecosystems and under natural field conditions, for the purpose of discovering which inorganic nutrients might most likely be responsible for the observed "trophic" differences between them. Laboratory aquatic microecosystems simulating both lakes were established in several types of containers with

living microbial communities from both lakes. Effects of enrichments with ammonia, phosphate, nitrate, silicate, iron, and chloride singly and in combinations were examined periodically for 30-40 days, by evaluating photosynthetic C-14 uptake rates by phytoplankton. Ammonia was the principal nutrient causing the differences in primary productivity between the two lake microecosystems. Phosphate also included a small but significant stimulation of primary productivity, especially in combination with ammonia. Other enrichments were ineffective. These comparative laboratory microecosystem studies revealed that ammonium ion concentration is a major factor causing productivity differences observed earlier in the field. Subsequent field enrichment studies, although conducted during a second season, essentially confirm these laboratory results. (Auth.)

B-11497
DeVries, A.L.
FREEZING RESISTANCE IN FISHES. Fish physiology, 1971 Vol.6, p.157-189, 48 refs.
QL639.1.H6

The occurrence of a large and varied fish fauna in the oceans of the polar regions illustrates how successfully fishes have been able to adapt to extremes of environmental stress. The mechanisms of cold adaptation which permit survival at low temperatures fall into two general categories: (1) mechanisms which permit survival per se at near-freezing temperatures and (2) mechanisms which lead to cold-adapted rates of activities in such physiological functions as respiration and growth. In this essay a particularly important example of the first class of cold adaptation mechanisms is considered, namely, the means by which fishes avoid freezing under environmental conditions where ice formation in the body fluids would most likely be favored. The analysis of this phenomenon emphasizes (1) the nature of low temperature stresses in freshwater and marine habitats and (2) the varied adaptive responses--both behavioral and biochemical--which offer fishes avenues of escape from injury resulting from freezing.

B-11508
Kriss, A.E.
MICROBIOLOGICAL STUDIES IN THE SOUTHERN OCEAN. Mikrobiologicheskie issledovaniia v IUzhnom okeane. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.209-218, In Russian. 9 refs.
G860.S63

The 353 water samples taken from the surface to the bottom in Prydz Bay, on the Freemantle-Mirnyy profile, and between Africa and Antarctica along 20 E in 1966-1967 were studied. Analysis shows that the number of bacteria in the Southern Ocean varies from 0 to 100 individuals in 50 ml of water, and the density of bacterial population is less in the western part of the Indian Ocean than in the eastern. The vertical distribution of bacteria is uneven: water layers without bacteria alternate with layers of up to 100 bacterial habitants in 50 ml of water.

B-11509
Medvedev, L.P.
SEA MAMMAL OBSERVATIONS. Nabliudeniia za morskimi mlekopitaiushchimi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.219-228, In Russian. 1 ref.
G860.S63

An analysis of sea mammal observations made during the 12th Antarctic voyage of the Ob' from Jan. 29 to May 7, 1967 has resulted in descriptions of the distribution and population of cetaceans and pinnipeds in the South Atlantic and Indian Ocean, including Davis, Sodruzhestvo, Kosmonavty and Riiser-Larsen Seas. The effect of ice conditions on the distribution of mammals is discussed. Systematic year-round observations of whales and seals in antarctic waters are suggested.

B-11519
El-Sayed, S.Z.
PRODUCTIVITY STUDIES IN THE WEDDELL SEA, THE BELLINGSHAUSEN SEA, AND THE WATERS SURROUNDING THE ANTARCTIC PENINSULA. U.S. Antarctic Projects Office. Bulletin, Summer 1965, p.40-44, 5 refs.

Plankton productivity studies were carried out during 1965 in the following areas: Argentine Coast, Drake Passage, Weddell Sea, Gerlache Strait, Bellingshausen Sea. The objectives were to measure primary production and standing crop of phytoplankton, study the factors effecting phytoplankton growth (particularly submarine light intensity), and determine species composition of plankton and seasonal changes in abundance. Chemical analysis of the water was also made. Lowest chlorophyll a content and C-14 uptake were found near the Antarctic Convergence. Weddell Sea productivity values exhibited considerable regional variation. Nutrient salts, surface water stabilization, temperature, light and grazing were studied; of these light and temperature are the most important factors governing phytoplankton productivity. Gerlache Strait values of phytoplankton standing crop were very high. Major diatom species are listed.

B-11535
Pavlov, V.IA.
ON THE PHYSIOLOGY OF FEEDING IN EUPHAUSIA SUPERBA. Akademiia nauk SSSR. Doklady. Biological sciences, Aug. 1971 196(1-6), p.147-150, Translation from Akademiia nauk SSSR. Doklady, 196(6):1477-1480, Feb. 21, 1971. 13 refs.

An analysis of the stomach content shows that the antarctic krill Euphausia superba Dana feeds on small and large forms of phytoplankton. Diurnal rhythm of the feeding habit is related to the rhythm of the swarm formation and individual krill speed of movement depends on food filtration time. The close connection of the gathering of food organisms to the method of catching them is discussed. For Russian original see B-9410.

B-11541
Short, R.B. , Hochberg, F.G., Jr.
TWO NEW SPECIES OF DICYEMENNEA (MESOZOA: DICYEMIDAE) FROM KAIKOURA, NEW ZEALAND. Journal of parasitology, June 1969 55(3), p.583-596, 4 refs.

Dicyemennea kaikouriensis is described from Octopus maorum and D. rostrata from Robsonella australis. Both hosts were collected near Kaikoura Peninsula, South Island, New Zealand. The peripheral cell number of vermiform stages of both species is typically 23. Nematogens and rhombogens of D. kaikouriensis are stocky, with relatively large calottes. Largest nematogens were about 428 to 683 microns in length; largest rhombogens measured about 800 to 1,050 microns. Vermiform embryos of this species lack an abortive axial cell and reach

about 90 to 100 microns at eclosion. Infusoriform larvae lack solid refringent bodies and are composed typically of 37 cells (33 somatic, 4 germinal). Nematogens and rhombogens of D. rostrata have more elongate bodies; larger specimens have expanded, disk-shaped or flowerlike cephalic enlargements which are composed of calotte and parapolar cells. Largest nematogens of this species seldom exceeded 1,500 microns in length: largest rhombogens measured about 1,778 to 2,376 microns in length. Vermiform embryos have an abortive axial cell; they are sharply pointed anteriorly and reach about 175 to 270 microns at eclosion. Infusoriform larvae possess solid refringent bodies and are composed typically of 39 cells (35 somatic, 4 germinal). (Auth.)

B-11547
Burkholder, P.R. , Burkholder, L.M.
MICROPLANKTON AND PRIMARY PRODUCTIVITY IN ANTARCTIC SEAS. Palisades, N.Y., Columbia University, Lamont Geological Observatory, [1965?], 265p., Unpublished manuscript. Refs. p.142-148

Phytoplankton, chlorophyll a, and materials for studies on primary productivity were collected aboard the Eltanin and Canepa from 50 S to the edge of the ice and between 20 W and 120 W from July 5, 1962 to April 21, 1964. The results of the geographic and monthly occurrence and behavior of microplankton in the South Atlantic and South Pacific Oceans are given. Diatom and chlorophyll a abundance was evaluated, and primary productivity of the oceans was studied by the carbon fixation method.

B-11556
Lloyd, D.G.
REVISION OF THE NEW ZEALAND, SUBANTARCTIC, AND SOUTH AMERICAN SPECIES OF COTULA, SECTION LEPTINELLA. New Zealand journal of botany, June 1972 10(2), p.277-372, 44 refs.
QK1.N56

The taxonomic position, status, and characters of Cotula, and its subdivision into three sections are briefly described. Section Leptinella is considered a well-defined taxon and its characters and relationships are discussed. Twenty-five species from New Zealand, the Subantarctic islands, and South America are described and classified into two series, Elongata and Radiata. The following new taxa and names are described: series Oligoleima (from Australia and New Guinea), Elongata and Radiata; five new species, C. dispersa, C. serrulata, C. calcarea, C. intermedia, and C. nana; two new names, C. albida and C. membranacea; five new combinations, C. rotundata, C. traillii, subsp. pulchella, C. pectinata subsp. villosa, C. pectinata subsp. willcoxii, and C. pyrethrifolia var. linearifolia; four new subspecies, C. dispersa subsp. rupestris, C. dioica subsp. monoica, C. squalida subsp. mediana, and C. atrata subsp. luteola. (Auth.)

B-11558
Erickson, A.W. , Gilbert, J.R., Petrides, G.A., Oehlenschlager, R.J., Sinha, A.A., Otis, J.
POPULATIONS OF SEALS, WHALES, AND BIRDS IN THE BELLINGSHAUSEN AND AMUNDSEN SEAS. Antarctic journal of the United States, July-Aug. 1972 7(4)
G845.A56

Population studies of seals, whales, and birds were conducted from Jan. 7 to Mar. 3, 1972 in the pack ice of the Bellingshausen and Amundsen Seas using USCGC Southwind and its two HH-52A helicopters. Estimates indicated a minimal population of 863,000 seals. The species composition was 92 percent crabeater, 4 percent leopard, 2.5 percent Weddell, and 1.5 percent Ross seals. Tallies revealed very high population levels of sei and Minke whales. Birds observed during the shipboard surveys totalled 10,270 and represented 10 species, the bulk of which were antarctic petrels, snow petrels, and arctic terns. A series of bird and seal specimens was collected for a number of different studies. High concentrations of mercury, cadmium, and other trace elements were identified in the livers of penguins and seals. Chromosome characterizations were made of Ross, leopard, and elephant seals, and a number of birds. Tissues collected during the season are still being analyzed.

B-11559
El-Sayed, S.Z. , Dill, W.T.
ECOLOGY OF PHYTOPLANKTON IN THE SOUTHEASTERN PACIFIC OCEAN STUDIED DURING SOUTHWIND CRUISE. Antarctic journal of the United States, July-Aug. 1972 7(4), p.72-73, 1 ref.
G845.A56

Nineteen hydrographic stations were occupied during the Jan.-Feb. 1972 cruise of Southwind in the Bellingshausen and Amundsen Seas. At these stations regular Nansen casts were made, light penetration was measured, and water samples were taken at several depths within and below the euphotic zone. Preliminary results show that the standing crop of phytoplankton in terms of chlorophyll was much higher in the western parts of the Amundsen Sea than in any other region studied.

B-11560
Siniff, D. , Reichle, R., Hofman, R., Kuechle, V.B.
POPULATION DYNAMICS AND BEHAVIOR OF WEDDELL SEALS AT MCMURDO STATION. Antarctic journal of the United States, July-Aug. 1972 7(4), p.73
G845.A56

Considerable effort was directed toward obtaining activity patterns of male Weddell seals during the 1971-72 field season. Monitoring of subsurface behavior with underwater television was continued, census data were obtained from a tagging program, and a sample of toenails was taken with a view toward obtaining age structure from their growth patterns. Three hundred and twenty-three adult seals were handled and marked during the season. The data are being analyzed.

B-11561
Pelts, W.J.L.
ANATOMICAL STUDIES OF ANTARCTIC SEALS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.73-74
G845.A56

An investigation of the macro- and microstructure of antarctic seals was initiated in the 1971-72 season with the aim of elucidating structural corollaries of known physiological parameters, and to define the structural aspects of the pinniped adaptation to the physical environment. The primary task in 1971 was therefore to make a limited number of comprehensive autopsies on Weddell seals to obtain tissue collections for microscopic analysis of all systems. Male and female adults and neonates were collected for study. Publications now in preparation will cover the

gastrointestinal tract, fetal anatomy and bone structure, the urinary tract, and the cardiovascular system.

B-11562
Kooyman, G.L. , Gentry, R.L., Bergman, W.P.
RESPIRATORY STUDIES OF SEALS AND PENGUINS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.74-75
G845.A56

During the fourth season of study in the Antarctic of respiratory adaptations in birds and mammals, lung function experiments were performed on crabeater seals in the Argentine Is. and experiments were begun at Palmer Station on the effects of immersion in Adelie penguins. The responses of the birds were measured in a metabolic chamber under varying environmental conditions. Comparison of results will yield information on the insulative properties of feathers.

B-11563
Muller-Schwarze, D. , Muller-Schwarze, C.
ANTIPREDATOR AND SOCIAL BEHAVIOR IN ANTARCTIC PENINSULA PENGUINS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.75
G845.A56

Visits to a number of penguin rookeries in the area of the Antarctic Peninsula during the 1971-72 austral summer yielded data on the species and number of nests, the presence or absence of leopard seals and skuas, and incidents of predation. Leopard seals were seen only near penguin rookeries with upward of 10,000 breeding pairs. Brown skuas were never seen to attack live penguin chicks; they scavenged on dead chicks and abandoned eggs. Social displays of gentoo and chinstrap penguins were analyzed at Harmony Point on Nelson I. On the Antarctic Peninsula up to three species breeding side by side can be found in one rookery, the chicks are better fed, and there is considerably less predation on penguins than in the Ross Sea area.

B-11564
Baker, J.R.
PENGUIN AND SKUA STUDIES AT HALLETT STATION. Antarctic journal of the United States, July-Aug. 1972 7(4), p.75-76
G845.A56

Skua investigations at Hallett Station this season included an observational study of feeding territories and feeding habit; observations of incubation behavior; a census of adults, eggs, and chicks; and mapping of the location of active nest sites. Time-lapse motions pictures were made of the incubation behavior of nesting penguin pairs and simultaneous egg incubation temperature recordings were made on strip-chart recorders from thermoprobes in artificial eggs in the nests. This season, 7,557 Adelie penguin chicks and 61 skua chicks were banded.

B-11565
Trillmich, F.
AVIAN ECOLOGY STUDIES AT HALLETT STATION. Antarctic journal of the United States, July-Aug. 1972 7(4), p.76-77, 2 refs.
G845.A56

Observations on the skua population, behavior, and feeding territories at Hallett Station, and the effects of human disturbance on the hatching success of the Adelie penguin are reported. Skuas breeding in or at the edge of the Adelie penguin rookery held well defined territories, however, 30 to 40 percent of the rookery area was not claimed as territory by the birds. The maximum adult population was 99 pairs on Dec. 10, 1971 which shows no decrease in population since a 1968-69 report of 98 pairs. Incubation behavior was studied using time-lapse cameras. There was no correlation between the frequency of human disturbance (in the form of periodic nest counts of Adelie adults, chicks, and eggs) and hatching success among the four groups of Adelies studied.

B-11566
Weller, M.W.
ECOLOGICAL STUDIES OF THE SOUTH GEORGIA PINTAIL (ANAS G. GEORGICA). Antarctic journal of the United States, July-Aug. 1972 7(4), p.77-78, 1 ref.
G845.A56

In order to determine food resources of the South Georgia pintail, usually referred to as "teal", samples were taken in areas where pintails were observed feeding. In general, pintails preferred ponds surrounded by tussock grass or other grasses of the more mature climax vegetation as opposed to areas surrounded by gravel, rock, or early plant successional stages. The excrement of the seals present in these areas undoubtedly enriched the waters. Freshwater ponds were extremely acid but had large numbers of a few taxa of invertebrates. Fairy shrimp (Branchinecta gaini) were particularly common during this summer period. On the seashore, in addition to eating invertebrates, some pintails fed on very fine filamentous marine algae adhering to boulders and cliffs in the tidal zone. Speckled teal (Anas flavirostris) which had not been reported previously from South Georgia, were observed regularly in the Moraine Fjord area.

B-11567
DeVries, A.L. , Checkley, D.M., Raymond, J.A.
PHYSIOLOGY AND BIOCHEMISTRY OF FREEZING RESISTANCE IN ANTARCTIC FISHES. Antarctic journal of the United States, July-Aug. 1972 7(4), p.78-79, 3 refs.
G845.A56

Determination of whole organism freezing temperatures for several species of Trematomus fishes from McMurdo Sound indicated that freezing occurred at approx -2.0C. For most of the fishes sodium chloride accounts for slightly less than half of the blood serum freezing point depressions while the remainder results from the presence of a series of relatively large molecular weight glycoproteins. Warm and cold acclimation experiments on T. borchgrevinki indicated that the level of glycoproteins does not appreciably change with either warm or cold acclimation. The glycoproteins isolated from the blood serums of various fishes have been studied in detail and their complete structure determined. It appears that the glycoproteins prevent freezing by binding to the surface of small ice crystals, which are potential nucleation sites.

B-11568
Dearborn, J.H. , Allen, K.W., Hureau, J.C., Arnaud, P.M.
ECOLOGICAL AND TAXONOMIC STUDIES OF ECHINODERMS, MOLLUSKS, AND FISHES FROM THE ANTARCTIC PENINSULA. Antarctic journal of the United

States, July-Aug. 1972 7(4), p.80-82, 3 refs.
G845.A56

Studies of echinoderms, mollusks, and fishes were carried out during Feb. and Mar. 1972 aboard R/V Hero in the vicinity of Anvers I. and south to Marguerite Bay. Studies emphasized the feeding and reproductive biology of selected species of echinoderms (various crinoids, asteroids, and ophiurcids), mollusks, and fishes; respiratory rates in echinoderms; and the physiology of fish blood. Taxonomic aspects were also important. The mollusk fauna from the west coast of the Antarctic Peninsula were found to be closely allied to the fauna of East Antarctica. Differences do occur, however in species diversity and relative abundance. Fish blood studies established the presence of erythrocytes in small numbers, 15 to 30 times less than in normal fish blood. in the Channichthyidae, the so-called white-blooded fishes.

B-11569
Johnson, W.S.
RESPIRATION IN NEW ZEALAND ECHINODERMS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.82
G845.A56

The respiratory physiology of sea urchins (Goniocidaris umbraculum and Eyechinus chloroticus) and starfish Pentagonaster pulchellus and Coscinasterias calamaria) were investigated for 6 wk in Oct. - Nov. 1971 at the Portobello Marine Biological Station in New Zealand. A summary of the oxygen consumption data will be published in the New Zealand Journal of Marine and Freshwater Research. The respiratory rates of New Zealand species of echinoderms are in the range of those for species from Monterey Bay.

B-11570
Lipps, J.H. , Delaca, T.E., Krebs, W., Stockton, W.
SHALLOW-WATER FORAMINIFERA STUDIES, ANTARCTIC PENINSULA, 1971-1972. Antarctic journal of the United States, July-Aug. 1972 7(4), p.82-83, 3 refs.
G845.A56

The present studies on the biology and ecology of shallow-water foraminifera were initiated to test the assumption that these organisms use different adaptive strategies in different environmental situations. Detailed sampling was carried out, using R/V Hero, in Arthur Harbor adjacent to Palmer Station, in Port Lockroy, around Wiencke I., and in Port Foster, Deception I. Sampling in these areas will provide data on local variations in distribution of foraminifera and on the effects on foraminifera of the recent volcanic eruptions at Deception I. that decimated portions of the macrobenthos. Preliminary study shows that species are depth zoned, generally in association with the distribution of algae and invertebrates.

B-11571
Burch, B.L.
COLLECTION OF BENTHIC ORGANISMS FROM THE ANTARCTIC PENINSULA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.83-84
G845.A56

Biological materials collected around the Antarctic Peninsula aboard R/V Hero from Nov. 21, 1971 to Feb. 8, 1972 yielded 329 gallons of fauna, flora, rocks, and sediments for distribution to the Smithsonian Oceanographic Sorting Center. Whenever possible, bottom trawling was done. Open bays and promontories of sea islands yielded rich samples of benthic flora and fauna. Plankton were abundant in midwater trawls. The richest and most diverse biological populations exist on the varying substrate around Anvers I. and at the southern side of the Admiralty Is.

B-11572
Hoshiai, T.
DIATOM DISTRIBUTION IN SEA ICE NEAR MCMURDO AND SYOWA STATIONS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.84-85, 1 ref.
G845.A56

Investigations of diatom distribution in sea ice near Showa Station revealed two brown ice layers -- one at 30 cm below the surface of the ice and one at the bottom. Fragillariopsis and Nitzschia were dominant species in the autumnal community (Mar. to early Apr.) and Amphiprora, Stephanopyxis, and Nitzschia species were prominent in the spring community (Oct. to Dec.). The colorless ice between the two brown layers contained Nitzschia species. In ice cores taken near McMurdo Station a brown ice layer 20 cm thick was found at the lowest part, and in the rest the bottom surface was colored. Few diatoms were found in the colorless part from the surface to a depth of about 140 cm. Nitzschia, Amphiprora, and Coscinodiscus were found in the colored layer and between the 140 cm layer and the brown ice layer, showing an increase in the number of species toward the bottom brown layer.

B-11573
Paterson, R.A. , Rooney, H.
AQUATIC FUNGI: THEIR OCCURRENCE IN THE MCMURDO OASIS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.85
G845.A56

Between Jan. 8 and Feb. 14, 1972, 400 soil and 72 fresh water samples were collected for study with special attention being given to McMurdo Station, Cape Royds, Miers Valley, and Victoria Valley. Preliminary observations of 147 of the samples at the Eklund Biological Center at McMurdo showed fungi species density to be low. Four species of saprophytic chytrids occurred in 47 samples. Rhizophydium proliferum Knox, Phlyctorhiza variabilis Karling, and Phylyctochytrium recurvastomum Knox were collected in many areas. Rhizophlyctis rosea (deBary and Woronin) Fisher, which appears to be a recent introduction, was collected at the McMurdo dump and from the Shackleton hut area at Cape Royds. Oomycetes observed from cultural studies on fourteen samples were species of Pythium.

B-11574
Strong, P.E.
TERRESTRIAL ENERGY FLOW STUDIES AT PALMER STATION. Antarctic journal of the United States, July-Aug. 1972 7(4), p.85-86
G845.A56

The terrestrial arthropod studies at Palmer Station during the 1971-72 austral summer concentrated on three major species: Cryptopygus antarcticus Willem, a collembolan, Belgica antarctica Jacobs, a wingless midge, and Alaskozetes antarcticus (Michael) a large orbatit mite. The arthropods are being studied to determine respiration rates; the populations' age structure, size classes, and biomass; feeding

rates; and to make calorimetric determinations.

B-11575
Longton, R.E.
STUDIES OF CLASSIFICATION, BIOMASS, AND MICROCLIMATE OF VEGETATION NEAR MCMURDO SOUND. Antarctic journal of the United States, July-Aug. 1972 7(4), p.86-88, 9 refs.
G845.A56

Plant ecological investigations were carried out from McMurdo Station between Dec. 6, 1971 and Jan. 6, 1972. 1) to determine whether a vegetation classification developed in the maritime Antarctic could be extended for use at a continental antarctic site, 2) to make preliminary determination of the biomass of bryophyte communities, and 3) to investigate the environmental adaptations of one species, the cosmopolitan moss Bryum argenteum, through studies of growth and reproduction in relation to microclimate. A tentative classification of the plant communities recorded near McMurdo Sound is presented. The observations suggest that it may prove possible to adapt the earlier classification to include the macroscopic terrestrial plant communities of Antarctica as a whole. Biomass can be determined from estimates of the dry weight and loss on ignition of soil samples from known areas. Detailed studies on growth and reproduction in Bryum argenteum were made on a population at Cape Armitage.

B-11576
Vishniac, W.V. , Mainzer, S.E.
SOIL MICROBIOLOGY STUDIES IN SITU IN THE DRY VALLEYS OF ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.88-89
G845.A56

Studies were made of soil microbial ecology in situ in an effort to determine whether microorganisms under highly adverse conditions, especially in environments in which water was the most important limiting factor, were dormant or whether they underwent active growth. The experiments could be grouped into four classes: growth in situ, chemical activity in situ, growth on culture medium, and growth in liquid suspension. Active growth of bacteria was demonstrated at all of the stations examined.

B-11579
Morelli, F.A. , Cameron, R.E., Gensel, D.R., Randall, L.P.
MONITORING OF ANTARCTIC DRY VALLEY DRILLING SITES. Antarctic journal of the United States, July-Aug. 1972 7(4), p.92-94, 5 refs.
G845.A56

Soil and air samples were obtained from various sites in the dry valleys for microbiological monitoring as part of the Dry Valley Drilling Project. The results are similar -- in abundance, physiological groups, and ecological sequence of microorganisms -- to results obtained in previous work (Cameron, 1971; B-9838 and Lacy, 1970; B-8366). However, growth was relatively rapid for contaminated sites, lactose fermentation was abundant, and some bacteria could survive (but not grow) following 24 hr of incubation at 55C.

B-11612
Despin, B. , Mougin, J.L., Segonzac, M.
BIRDS AND MAMMALS OF EAST ISLAND. Oiseaux et mammifères de l'Ile de l'Est. Comité national français des recherches antarctiques. CNFRA, 1972 No.31, 106+6p., In French with English summary. Numerous refs.

The East Island, Crozet Archipelago environment, with emphasis on avifauna, is analyzed, as the result of a two months stay from December 24, 1970 to February 23, 1971. The introduction summarizes the morphology, hydrology, flora, and meteorology of the island, the body of the text being devoted to fauna. Thirty-eight bird species, including three vagrant (one penguin, two waders), inhabiting the island include albatrosses, petrels, penguins, shags, ducks, sheath-bills, skuas, gulls, and terns. Three seal species and one introduced species, rabbit, are also present. Detailed studies of all these species stress breeding sites and cycles, mortality, and feeding habits. Measurements of East Island birds are compared with those of birds of other breeding localities. The biomass of the fauna is examined in relation to annual variations of food resources. Finally, problems in the biology of East Island fauna are discussed, with emphasis on the influence of introduced predatory mammals.

B-11619
Lange, O.L.
LICHENS--PIONEER PLANTS IN COLD DESERTS. Flechten--Pionierpflanzen in Kaltewusten. Umschau, Oct. 1972 72(20), p.650-654, In German with English summary. 9 refs.

Lichens are pioneer plants in the cold deserts of the Arctic, Antarctic and the nival regions of high mountains. The cold adaption of antarctic lichens is reported. The relation of temperature to lichen distribution and photosynthesis is discussed on the basis of laboratory and field observations.

B-11622
Smith, R.N.
FREEZING RESISTANCE OF ANTARCTIC FISH: I. SERUM COMPOSITION AND ITS RELATION TO FREEZING RESISTANCE. British Antarctic Survey. Bulletin, June 1972 No.28, p.1-10, 52 refs.
QH84.2.B72

In polar regions the blood of teleost fish may be supercooled for all or part of the year. The supercooled state is stable and does not endanger survival of the fish unless freezing is initiated by contact with ice. Serum from nine species of Antarctic fish was analyzed to determine which component, if any, would aid survival in this circumstance. Two sub-tropical species were studied for comparative purposes. Antarctic fish serum was found to be a more concentrated solution than temperate fish serum and unusually high concentrations of serum reducing sugar occurred in most Antarctic species. In the two species which were studied both in summer and winter, the concentrations of most serum constituents increased in winter, but the increases were insufficient to lower the serum freezing point to that of sea-water. It is unlikely that inorganic serum constituents contribute significantly to the freezing resistance of a supercooled fish in contact with ice, but serum reducing sugar and possibly protein and glycoprotein appear to protect the blood from freezing, probably by preventing or retarding the nucleation and propagation of ice in the blood. (Auth.).

B-11623
Edwards, J.A.
STUDIES IN COLOBANTHUS QUITENSIS (KUNTH) BARTL. AND DESCHAMPSIA ANTARCTICA DESV.: V.

DISTRIBUTION, ECOLOGY AND VEGETATIVE PERFORMANCE ON SIGNY ISLAND. British Antarctic Survey. Bulletin, June 1972 No.28, p.11-28, 17 refs.
QH84.2.B72

The detailed distribution of Colobanthus quitensis and Deschampsia antarctica on Signy I. is presented together with an account of their ecology at the principal sites. Differences in vegetative performance between localities are compared with observed changes after artificial modifications of the micro-environment. It is suggested that the present distribution of both species on the island is a reflection of the sequence of deglaciation and that new localities are colonized primarily by vegetative dispersal via biological agencies, particularly cape pigeons. (Auth.)

B-11624
Willey, L.E.
BELEMNITES FROM SOUTH-EASTERN ALEXANDER ISLAND: I. OCCURRENCE OF THE FAMILY DIMITOBELIDAE IN THE LOWER CRETACEOUS. British Antarctic Survey. Bulletin, June 1972 No.28, p.29-42, 49 refs.
QH84.2.B72

Five species of the family Dimitobelidae (Belemnoidea) are described from sediments of Lower Cretaceous age on the south-eastern coast of Alexander I. Peratobelus is described for the first time from outside Australia Two species appear to be new but they are not considered to be preserved sufficiently well to be formally described. The stratigraphical distribution of this family in Alexander I. is discussed. (Auth.)

B-11625
Lindsay, D.C.
NOTES ON ANTARCTIC LICHENS: VI. GENUS SPHAEROPHORUS PERS.. British Antarctic Survey. Bulletin, June 1972 No.28, p.43-48, 15 refs.
QH84.2.B72

Three species of Sphaerophorus are discussed. S. globasus (Huds.) Vain. is reported as being widespread throughout the Antarctic Peninsula and Scotia Ridge. S. melanocarpus (Sw.) DC. is recorded from the Falkland Is. and South Georgia, while S. tener (Laur.) Vain. f. globosoides J. Murr. is reported from the Falkland Is., the first record of this form outside New Zealand or Tasmania. All three species were found to contain squamitic acid. S. globosus exists as two chemical strains, one centered on the Falkland Is. and South Georgia, the other centered on the Antarctic Peninsula. (Auth.)

B-11626
Walker, A.J.M.
INTRODUCTION TO THE ECOLOGY OF THE ANTARCTIC LIMPET PATINIGERA POLARIS (HOMBRON AND JACQUINOT) AT SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, June 1972 No.28, p.49-69, 15 refs.
QH84.2.B72

At Signy I. in summer the patellid species Patinigera polaris occurs in the littoral and sub-littoral zones but in winter it is found in the littoral zone only under certain conditions. The species is able to withstand freezing temperatures but only for a limited time; prolonged subjection to low air temperatures causes mortality. However, limpets in the littoral zone avoid the harsh winter climate by a downward movement in autumn. In spring there is a return movement up into the littoral zone. Such behavioral adaptations, or the ability to tolerate low air temperatures, or both, are typical of polar littoral organisms. The environmental factor eliciting downward movement appears to be correlated with air temperature, and may be the ice film that forms on littoral rocks in autumn when the air temperature falls below the freezing point of the sea. On some shores fast ice later insulates the lower littoral zone from the prevailing air temperature at low tide, the ice film on the rocks then disappears, and limpets may return to the littoral zone. After the break-up of the fast ice these limpets exposed to air return to below low-water mark. At Signy Island there are two main populations. The numerically smaller of these exhibits seasonal movement as described, while the other remains in the sub-littoral zone all year round. They can be distinguished by differing shell characteristics. (Auth.)

B-11628
Robins, M.W.
NEW COMMENSAL HYDROID FROM ANTARCTICA. British Antarctic Survey. Bulletin, June 1972 No.28, p.75-81, 10 refs.
QH84.2.B72

A new marine gymnoblastic hydroid Monobrachium antarctica, is described from Signy I., South Orkney Is. The hydroid lives in commensal association with several species of lamellibranch molluscs which burrow in fine sand. Various aspects of the ecology of the hydroid and the hosts Mysella charcoti and M. miniascula were studied by free-diving techniques and by laboratory investigation. The taxonomic position of this hydroid within the genus Monbrachium is considered together with a brief review of the characteristics of other species of the genus. (Auth.)

B-11629
Grolle, R.
HEPATICS OF THE SOUTH SANDWICH ISLANDS AND SOUTH GEORGIA. British Antarctic Survey. Bulletin, June 1972 No.28, p.83-95, 35 refs.
QH84.2.B72

This paper reports 11 species of hepatics and sterile material of a Cephaloziella from the South Sandwich Is.; all are represented on South Georgia. A revised annotated list is given of 24 species of hepatics from South Georgia and reference is made to material of Clasmatocolea, Plagiochila and Riccardia which is not identified to the specific level. Lectotypes are designated for all species from South Georgia described by Gottsche (1890). A new combination Clasmatocolea georgiensis (Gottsche) Grolle is proposed and a new species, Lophocolea willii Grolle, is described. A list of synonyms and excludenda is included. (Auth.)

B-11630
Thomson, M.R.A. , Willey, L.E.
UPPER JURASSIC AND LOWER CRETACEOUS INOCERAMUS (BIVALVIA) FROM SOUTH-EAST ALEXANDER ISLAND. British Antarctic Survey. Bulletin, Aug. 1972 No.29, p.1-19, 30 refs.
QH84.2.B72

Nine species of Inoceramus (Bivalvia) are described from sediments of Upper Oxfordian Kimmeridgian to Upper Aptian age on the south-eastern coasts of Alexander I. Most of the species appear to be new and two, I. pseudosteinmanni sp. nov. and I. trapezoidalis sp. nov. are preserved well enough to be formally described. The stratigraphical distribution of the species in Alexander I. is discussed. (Auth.)

B-11634
Smith, R.N.
FREEZING RESISTANCE OF ANTARCTIC FISH: II. FREEZING POINTS OF BODY FLUIDS. British Antarctic Survey. Bulletin, Aug. 1972 No.29, p.91-102, 68 refs.
QH84.2.B72

Methods for measuring freezing points are critically reviewed with particular emphasis on their application to biological fluids. A modified version of the Ramsay and Brown (1955) freezing-point method is described by which the freezing points of small samples may be measured to plus or minus 0.02C. The freezing points of serum, aqueous humour, urine, cerebrospinal fluid, bile and tissue fluid of nine Antarctic teleosts were found to lie between -0.65 and -1.34C. No marked differences were found in the freezing points of different body fluids in the same fish. Measured and calculated values of serum freezing-points were in reasonable agreement. Diuresis occurred in fish that were used for freezing experiments and may have been the result of handling the fish. The freezing-point measurements confirmed the results of chemical analysis and the principal conclusion was that the fish are supercooled at low environmental temperatures. (Auth. mod.)

B-11641
Penney, R.L.
LEOPARD SEAL - SOUTH POLAR PREDATOR. Animal kingdom, Oct. 1969 72(5), p.2-7

A non-scientific, personal account of observations of leopard seals is given to show their great power, eating habits, and danger to man. The behavior of these seals while hunting their major food, penguins, is described. At Cape Crozier, it is estimated that on a 100 yard stretch of beach 19 adult penguins were killed a day during the study, roughly 5 percent of the breeding population throughout the breeding season (late October to late January). Chicks are also killed when swimming away from the rookery, but in comparison with deaths from blizzards and skua predation, the effect is considered minor. Incidences of leopard seals attacking men walking along the edge of the ice are included.

B-11643
Corte, A.
BIOECOLOGICAL ASPECTS OF THE SNOW PLANT COMMUNITIES OF CAPE SPRING, ARGENTINE ANTARCTICA. Ecology of the subarctic regions. Vol.1 of Ecology and conservation, Paris, Unesco, 1970, p.101-104, 12 refs.

Field studies of snow cryoplankton at Cape Spring, Antarctica made during the summer seasons of 1957-1958 and 1960-1961 by the Instituto Antartico Argentino are reported. Cryoplankton growth increases with increase in photo period and at full development accelerates snow melting and produces a surface having holes and cracks. Cryoplankton was found in Nov. 1960 in an ice layer 30 cm thick under 2 m of snow. Several algae were identified, including Scotiella, which may be identified by snow color. Temperatures during the two summers and chemical analysis of meltwater according to snow color are summarized in tables.

B-11650
Shaughnessy, P.D.
ONTOGENY OF HEMOGLOBIN IN THE ROYAL PENGUIN EUDYPTES CHRYSOLOPHUS SCHLEGELI. Journal of embryology and experimental morphology, 1970 24(2), p.425-428, In English with French summary. 7 refs.

Hemoglobins of chicks, yearlings, and known-age sub-adults of the royal penguin were investigated by starch-gel electrophoresis at pH 8.6. Two hemoglobin components were observed in yearlings and sub-adults. These were assumed to be the hemoglobins of adults. Another three hemoglobin components were observed in three-week-old chicks. In seven out of eight fledging chicks, these chick hemoglobins had disappeared. The existence of other hemoglobin components in royal penguin embryos is predicted. (Auth.)

B-11660
ENTER THE ICE FISH. Sciences, Feb. 1966 5(9), p.5-7

The so-called ice fish, a transparent inhabitant of Antarctic waters, is studied briefly. The fish's blood was found to contain 0.67 percent oxygen by volume - e.g., only the amount of oxygen that the plasma could hold in solution (the colorless blood possesses no hemoglobin). The fish's environment is deep, well-aerated water with plentiful food and a temperature between -1.7C and 3C. The virtually invisible coloring, large mouth, and small body suggest that the fish traps prey that approach it unawares, therefore, using little oxygen. It is suggested that oxygen replacement is made possible by a relatively large volume of body fluid, very well-developed heart, and small number of scales (the naked skin with its rich supply of blood vessels possibly providing a supplemental gas exchange medium). Dissection of the spleens of various species revealed that at least one has no red corpuscle-producing capability, while other species do produce a small number. Evidence of red-cell formation by the liver exists for one species. Beyond this, understanding of the life processes of the ice fish is lacking.

B-11692
McWhinnie, M.A.
INTEGRATED BICLOGY PROGRAMS IN ANTARCTIC WATERS, 1972. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.173-174, 4 refs.
G845.A56

The second integrated program of biological studies conducted during USNS Eltanin Cruise 51 into the Ross Sea, from Jan. 17 to Feb. 25, 1972, included meteorological, chemical, biochemical, hydrographic, and biological studies designed to describe the antarctic marine ecosystem with particular reference to energy flow into and through the biota of the euphotic zone. A total of 523 samples were obtained. Continuous spectral radiometric recording of solar energy and its net penetrance into the water column was conducted through all daylight hours. In addition, meteorological observations, precision depth recording, and satellite fixes for navigation were continuous. All data obtained have been translated and stored in computer form aboard Eltanin.

B-11693
El-Sayed, S.Z. , Fay, R.
ECOLOGICAL STUDIES OF PHYTOPLANKTON BETWEEN NEW ZEALAND AND THE ANTARCTIC. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.174-175, 1 ref.
G845.A56

The investigations carried out during Eltanin Cruise 51 on the ecology and productivity of phytoplankton included descriptions of the physical and chemical environment, and biological studies. Preliminary analysis of the data showed low chlorophyll a concentration in the vicinity of the Polar Front (Antarctic Convergence) and high surface chlorphyll a values to the north of the Polar Front and at one station in pack ice and three in front of the Ross Ice Shelf.

B-11694
Franceschini, G.A.
SPECTRAL COMPONENTS OF SOLAR RADIATION AVAILABLE TO THE EUPHOTIC ZONE. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.175-176, 1 ref.
G845.A56

Measurements were made of the downwelling and upwelling radiation made available for photosynthesis using two similar sets of four hemispheric sensors (Eppley precision spectroradiometers), which measured continuously the radiation fluxes in four wavebands a short distance above the surface of the water. Downwelling radiation showed a percentage increase in the blue component and a decrease in the red and infrared with increasing solar altitude. Compared to the incident flux, the upwelling radiation was richer in the visible bands but poorer in the infrared. The ratio of upwelling to downwelling components decreased in each waveband with increasing solar altitude. However, the ratio was smaller for the longer wavelength bands. The quality of the energy made available for photosynthesis differs from that of the incident light.

B-11695
McWhinnie, M.A. , Kirchenberg, R.J.
PHYSIOLOGY OF ANTARCTIC ZOOPLANKTON WITH SPECIAL REFERENCE TO CRUSTACEANS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.176-177, 6 refs.
G845.A56

Respirometric study of pelagic invertebrates in south circumpolar waters was continued during Eltanin Cruise 51. The data obtained support earlier interpretations concerning a direct route of absorption of soluble organic compounds by zooplankton including crustaceans. Treatment with antibiotic does not decrease the amount of C-14 amino acid incorporated into the ethanol-insoluble fraction, or the whole, of animal homogenates. Zooplankton respiration rates may be expected to range from 1.0 to 43 microliters of oxygen per cubic meter per hour. Converting to other units, an intermediate value within this range would be about 0.054 milligram-atoms of oxygen per cubic meter per day. This value is considerably below a number of reported values for the western Atlantic and eastern Pacific.

B-11696
Bahnweg, G. , Sparrow, F.K., Jr.
MARINE PHYCOMYCETES: OCCURRENCE SOUTH OF NEW ZEALAND AND IN THE ROSS SEA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.177-178, 4 refs.
G845.A56

Water samples, bottom sediments, floating algae, phytoplankton, and zooplankton collected during Eltanin Cruise 51 were examined for saprophytic fungi, particularly marine phycomycetes. Molds and yeasts were either absent or found in very low numbers. The crustaceans collected, however, (mainly Euphausia crystallorophias) were always found in association with yeasts. The nature of this association is not known. Noteworthy was the unusual occurrence of a dense phycomycete population, made up of only one species, south of the Antarctic Convergence. The same organism and others were found in water samples and bottom sediment in the Ross Sea and again at stations in front of the Ross Ice Shelf. All of the phycomycetes found in antarctic waters south of the Polar Front are somewhat similar to Dermocystidium sp. sensu Goldstein and Moriber (1966).

B-11697
Bottino, N.R.
FATTY ACID EXCHANGE AMONG TROPHIC LEVELS OF THE ROSS SEA: PHYTOPLANKTON, COPEPODS, AND EUPHAUSIIDS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.178-179
G845.A56

Fatty acid types and proportions were studied in the unfractionated lipids of Euphausia superba, E. crystallorophias, phytoplankton, and copepods collected at various stations in the Ross Sea. E. crystallorophias lipids were more unsaturated than those of E. superba. Comparison of the fatty acid profiles of the two euphausiids with those of phytoplankton showed a higher degree of similarity between E. superba and phytoplankton fatty acid patterns than those of E. crystallorophias and phytoplankton. Little correlation could be established between the fatty acid profiles of euphausiids and copepods.

B-11698
Sackett, W.M. , Brooks, J.M.
STABLE CARBON ISOTOPE VARIATIONS IN THE ANTARCTIC MARINE ECOSYSTEM. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.179-180
G845.A56

During Eltanin Cruise 51, sediments, water samples, and all types of biota were collected for investigation of carbon isotope variations in the antarctic marine ecosystem. Program goals were largely realized.

B-11699
Morita, R.Y. , Griffiths, R.P., Hayasaka, S.S.
HETEROTROPHIC POTENTIAL OF ANTARCTIC MARINE MICROORGANISMS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.180-181, 4 refs.
G845.A56

The main objective of these studies was to measure the extent of microbial participation in the mineralization process in antarctic waters. In most water samples studied there was a marked increase in heterotrophic potential with increased incubation temperature within the -2.5 to 11.0C range. A significant reduction in substrate uptake above 11C was noted. The data indicated that in order to avoid erroneous estimates of heterotrophic potential, in situ temperatures must be used. Of 14 different labeled substrates evaluated for their ability to be taken up by marine microorganisms, serine, alanine, and glutamate were taken up at the highest rate. In general the highest microbial activity occurred near the Ross Ice Shelf and the lowest, north of the Antarctic Convergence.

B-11700
Carlucci, A.F. , Holm-Hansen, O., Williams, P.M.

DISTRIBUTION AND COMPOSITION OF PARTICULATE AND DISSOLVED ORGANIC MATTER IN ANTARCTIC WATERS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.181
G845.A56

Water column samples were collected at 14 stations, frozen, and transported to laboratories for studies pertaining to the following topics: distribution of microbial cells; nitrogen assimilation; transfer of organic carbon in the food chain; vitamins; elemental composition of organic material, gross and specific chemical composition of particulate material and plankton; chlorinated hydrocarbons; and distribution of mercury.

B-11701
Hammond, D. , Doyle, R., Elsner, R., Wyburn, R., Gruenau, S., Hill, P.
TEMPERATURE REGULATION AND RELATED STUDIES ON THE WEDDELL SEAL, LEPTONYCHOTES WEDDELLI. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.182
G845.A56

This year's program concentrated on the energy requirements for Weddell seal pups immediately after delivery and in the prenursing period. By observing pups being born it was possible to start recording oxygen consumption and body core temperature of the newborn pups within 9 to 20 min of life. They showed very high metabolic rates during the immediate postpartem period. The relationship of temperature regulation to the amount of blood flowing to the peripheral circulation system was determined on four weaned seal pups sent to Massey University. A pilot study to determine the techniques for implantation and recording of electroencephalographs was also carried out.

B-11702
Risebrough, R.W.
ORGANOCHLORINE POLLUTANTS IN SOUTHERN OCEANS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.182-184, 6 refs.
G845.A56

If the global dispersal pathways of DDT and polychlorinated biphenyls (PCB) are comparable, PCB might be expected in all antarctic specimens in which the DDT compounds have been detected. Experiments at Palmer and Hallett Stations, however, showed a substantial number of specimens containing DDT compounds but no detectable PCB. The possibility of contamination from local sources is being considered. Young Adelie penguins have been obtained from Hallett and McMurdo Stations for analyses of contamination levels. A series of specimens from Snares I. contained substantial amounts of both DDT and PCB compounds. Similarly, specimens from Kerguelen contained PCB. These results provide additional evidence of the global dispersal of organochlorine pollutants by a combination of air and water transport.

B-11703
Shabica, S.V.
TIDAL ZONE ECOLOGY AT PALMER STATION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.184-185, 5 refs.
G845.A56

The effects of ice on the ecology of Arthur Harbor were observed while studying tidal zone ecology at Palmer Station. Anchor ice had a negligible effect on the biota. Large icebergs entering Arthur Harbor, however, often become grounded and cause extensive destruction of the substrate and its fauna. Brash ice may be indirectly related to the distribution of at least four species of ctenophores in the surface waters. Studies of life in six tide pools showed the formation of thick layers of shore ice and snow during the coldest part of the winter with a marked reduction in the size and number of the algal population. The fructification of one species, however, was attributed to the protection afforded the algae by the ice, which permitted their wintering over between tidemarks.

B-11704
Richardson, M.D.
BENTHIC STUDIES IN THE ANTARCTIC. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.185-186
G845.A56

Soft-bottom benthos sampled at Palmer Station and sorted to date indicate a high diversity of species and higher taxa, and high faunal density and biomass. Numerical community analysis will be applied to the data. Community characteristics and variations between benthos will be studied. A survey was conducted on Deception I. to determine the effects of volcanic eruptions on the benthic invertebrates. The number of individuals at each station was low except at one station at the mouth of Port Foster and a station near the Argentine base. The effects of the recent volcanic eruption on community structure and on larger epibenthic organisms will be studied.

B-11705
Thomas, C.W.
TWO SPECIES OF ANTARCTIC ROTIFERS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.186-187, 3 refs.
G845.A56

Two species of rotifers -- Brachionus quadridentatus Hermann and B. calyciflorus Pallas -- collected from meltwater pools on Clark Peninsula are described. Both species are generally found in temperate waters and were taken from water temperatures of 2 and 3C. The same species are also common in small ponds in New Zealand where temperatures reach a minimum of 10C. It is believed that these are the first specimens of Brachionus ever taken in polar waters. Other biota found in the collections are briefly mentioned.

B-11706
Cameron, R.E. , Morelli, F.A., Johnson, R.M.
BACTERIAL SPECIES IN SOIL AND AIR OF THE ANTARCTIC CONTINENT. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.187-189, 8 refs.
G845.A56

More than 400 isolants have been identified from soil and air samples collected at various antarctic sites during the austral summers 1966-72. A summary list of the identified species is given including information on the common habitat of each species, and the frequency and general geographical location of the bacterial genera are shown. The most frequently isolated soil bacteria as shown by the studies were Corynebacterium and Arthrobacter spp. Air sample isolants were primarily Bacillus spp. A number of this species could originate from contaminating sources. These studies should contribute significantly to an understanding of an extraterrestrial environment such as Mars.

B-11737
Dreux, P.
INITIAL DATA ON ENTOMOLOGICAL FAUNA OF EAST ISLAND (CROZET ARCHIPELAGO). Premières données sur la faune entomologique de l'Île de l'Est (Archipel Crozet. TAAF (Paris), April-Sept. 1971 No.55-56, p.45-54. In French. 2 refs.
G845.F7

Very brief data on the distribution of insect life on East Island, Crozet Archipelago is given. Coleoptera (Trechidae, Staphylinidae, Pselaphidae, Hydraenidae, Curculionidae); Lepidoptera (Tineidae, Hyponomeutidae); Hymenoptera (Eucoilidae); Diptera (Tendipedidae, Simuliidae, Ceolopidae, Helomyzidae, Cypselidae, Ephydridae); Heriptera (Henicocephalidae); Psocoptera (Elipsocidae); Mallophaga (Philipteridae); and Collembola (Hypogastruridae, Sminthuridae) are discussed. The brief study showed the homogeneity of Crozet insects as well as interesting points on ecological adaptation of certain species. Two species of Collembola (Friesea jeanneli Denis and Katianna kerguelenensis Denis) were discovered, the first time seen in the Crozet Archipelago. A lengthier study is recommended, particularly of the littoral.

B-11738
Lesel, R.
REPORT ON THE STATE OF DEVELOPMENT OF THE FERAL CAT (FELIS LYBICA L.) ON THE KERGUELEN ISLANDS, JANUARY 1, 1968. Rapport sur l'état de développement de la population de chat féral (felis Lybica L.) aux Îles Kerguelen au 1er janvier 1968. TAAF (Paris), April-Sept. 1971 No.55-56, p.55-63. In French. 5 refs.
G845.F7

The extremely successful adaptation of cats (probably introduced in the early 1950's) at Kerguelen is examined. They are generally healthier than domestic cats, both larger and showing no signs of parasites. The cats feed on rabbits, birds (particularly those that live in holes), and occasional vegetable matter and have spread rapidly since they have no natural enemies. The cats live in holes in the soil and breed normally. Various measures to decrease the cat population in order to protect Kerguelen birds are considered, including three cat diseases that have been used in Europe with no sign that other species are susceptible. However, caution must be used in introducing the diseases.

B-11755
Llano, G.A. ed
ANTARCTIC TERRESTRIAL BIOLOGY. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Washington, American Geophysical Union, 1972. 322p., Numerous refs.

These 13 original papers on terrestrial biological research initiate a companion to Biology of the Antarctic Seas, which now comprises four volumes of the Antarctic Research Series. The articles in this volume range in subject matter from the limnology, physiology, and ecology of aquatic systems to the taxonomy of fresh-water algae, lichens, mosses, fungi, protozoa, and land arthropods of Antarctica. Also included are contributions on antarctic soils and subantarctic rain forests. For abstracts of the 13 papers in this volume see B-11756 to 11768.

B-11756
Goldman, C.R. , Mason, D.T., Wood, B.J.B.
COMPARATIVE STUDY OF THE LIMNOLOGY OF TWO SMALL LAKES ON ROSS ISLAND, ANTARCTICA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.1-50, 63 refs.

Studies of Algal and Skua Lakes on Cape Evans illustrate the extremes in the variety of conditions found among the shallow bodies of water of the McMurdo Sound region. The phytoplanktonic production of Skua Lake is almost 10 times as great per unit area as that of Algal Lake. The benthos grows thicker in Algal Lake than it does in Skua Lake. The chemical characteristics of both lakes reflect their proximity to the ocean and the kenyte lava surrounding them. The predominant biological factor in the environment of the two lakes is the skua. Its activities remove nothing from the cape and bring to it some of the organic production and trace element concentration of the fertile Ross Sea. The rates of production and the resulting efficiencies for the biological productivity of each lake are remarkably similar.

B-11757
Koob, D.D. , Leister, G.L.
PRIMARY PRODUCTIVITY AND ASSOCIATED PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS OF LAKE BONNEY: A PERENNIALLY ICE-COVERED LAKE IN ANTARCTICA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.51-68, Ohio State University. Institute of Polar Studies. Contribution No.213. 30 refs.

Limnological factors in Lake Bonney were measured during the austral summer of 1965-1966. These factors included chlorophyll a, bacterial and green cell concentrations, carbon fixation, conductivity, temperature, light, dissolved oxygen, pH, and alkalinity. The ice cover at the study area was 4 m thick, and the lake including the ice was 30 m deep. Biologically important phytoplankton populations encountered included Chlamydomonas subcaudata between 7 and 16 m, with maximum concentration at 12 m below the ice surface; an unidentified unicellular coccoid alga between 4 and 13 m, the maximum concentration occurring at 6 m; and numerous unidentified pigmented rod-shaped organisms at 4 m, just under the ice. Large populations of bacteria were found associated with the algal populations. Primary productivity was measured by the in situ C-14 method. Carbon fixation maximums occurred at 9 and 13 m, secondary peaks occurring at 4 and 6 m. There is little doubt that the carbon fixation at 4, 6, and 13 m is due to the aforementioned phytoplanktonic concentrations occurring in these regions. The carbon uptake at 9 m was completely unexpected.

B-11758
Parker, B.C. , Samsel, G.L., Prescott, G.W.
FRESH-WATER ALGAE OF THE ANTARCTIC PENINSULA. 1. SYSTEMATICS AND ECOLOGY IN THE U.S. PALMER STATION AREA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.69-81, 42 refs.

A great variety of fresh-water planktonic and Aufwuchs algae from small melt pools and year-round ponds near the U.S. Palmer Station, Anvers Island, Palmer Archipelago, are described. When it is possible, this preliminary survey attempts to correlate algal distributions with geologic, physical, and chemical environmental features measured during the collecting. It is believed that a much greater diversity of nearly all major groups of fresh-water antarctic algae occurs at

more southerly latitudes than has been supposed previously. In the Palmer Station area, freshwater habitats exhibit the complete range of trophic levels from extreme oligotrophy with a paucity of species and low organic production to hypereutrophy with blooms of a single or a few species. Eutrophication is enrichment induced during the antarctic summer by penguin rookeries, elephant seal colonies, and other resident bird populations.

B-11759
Lange, O.L. , Kappen, L.
PHOTOSYNTHESIS OF LICHENS FROM ANTARCTICA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.83-95, 30 refs.

Laboratory studies of lichens from Antarctica (Hallett Station, Victoria Land) revealed that their adaptation to the cold and dry conditions of this continent is a result of special features of their frost resistance and photosynthetic capabilities. Specifically, findings have shown the following: 1) Desiccation and cold resistance of antarctic lichens are extraordinarily high. 2) High photosynthesis production of antarctic lichens in nature during brief periods of hydration by melting snow can occur despite low temperatures. 3) Antarctic lichens can achieve a photosynthetic gain during the long periods in which they are frozen. 4) Lichen productivity is possible when they are snow covered. 5) Desiccated thalli are able to reactivate their photosynthetic activity after the uptake of water vapor from the air. In addition to these findings the different behaviors of the investigated species are discussed in relation to ecologic considerations.

B-11760
Schofield, E. , Ahmadjian, V.
FIELD OBSERVATIONS AND LABORATORY STUDIES OF SOME ANTARCTIC COLD DESERT CRYPTOGAMS. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.97-142, Ohio State University. Institute of Polar Studies. Contribution No.214. 134 refs.

Field observations and laboratory studies suggest that the type of nitrogen compounds and the concentration of water-soluble salts determine the distribution of macroscopic terrestrial cryptogams (algae, mosses, and lichens) in continental Antarctica. In laboratory experiments the isolated mycobiont of Lecanora tephroeceta Hue, a 'nitrophilous' lichen collected in a snow petrel rookery in West Antarctica, grew best in pure culture on reduced nitrogen compounds, particularly on ammonia and ammonia-yielding compounds. Uric acid, xanthine, urea, three amino acids with nonpolar side chains (proline, alanine, and leucine), and two amino acid amides (asparagine and glutamine) in addition to organic and inorganic ammonium salts sustained significant growth, whereas ribosides, pyrimidines, peptides, allantoin, and nitrates did not. The distribution of L. tephroeceta indicates that the important determining factor is ornithogenic nitrogen in the environment. The patterns of growth and nitrogen source use of a number of species are discussed. Ammonia is considered an ideal source of nitrogen for plants in the saline cold deserts in Antarctica.

B-11761
Rastorfer, J.R.
COMPARATIVE PHYSIOLOGY OF FOUR WEST ANTARCTIC MOSSES. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.143-161, Ohio State University. Institute of Polar Studies. Contribution No.121. 63 refs.

Calliergidium austrostramineum, Drepanocladus uncinatus, Polytrichum strictum, and Pohlia nutans are major components of well-developed plant communities on the easternmost island of the Corner Islands, Argentine Islands, Antarctica. The four species are compared as to element, chlorophyll, lipid, and carbohydrate concentrations as well as to the effects of different temperatures on photosynthesis and respiration. Comparisons with other antarctic plants and with plants of other regions, especially mosses, are also discussed. The results reveal several physiological differences between the acrocarpous species P. strictum and P. nutans and the pleurocarpous species C. austrostramineum and D. uncinatus. Although these observed physiological differences do not provide enough information to elucidate the adaptive relationships of these morphologically dissimilar forms to the antarctic environment, the pigment content and the influences of light intensity and temperature on photosnythesis may be important factors.

B-11762
Robinson, H.E.
OBSERVATIONS ON THE ORIGIN AND TAXONOMY OF THE ANTARCTIC MOSS FLORA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.163-177, 19 refs.

Recent moss collections from the Antarctic Peninsula are cited, and a listing of the 30 genera and approximately 70 species that have been reported from the continent is given. Sarconeurum tortelloides S.W. Greene is transferred to Tortella, and the new combination is made for Platydictya densissima. The distinctions are given for most of the species. The generic limits of Pseudodistichium are discussed, and P. fuegianum Roiv. is newly reported from the Antarctic. The possible origin of the moss flora is discussed. Great antiquity of the endemics is doubted, and the frequency of widely ranging species is noted.

B-11763
Singer, R.
NEW BASIDIOMYCETE FROM THE ANTARCTIC. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.179-180, 3 refs.

The southernmost fungus yet collected fructifying is a specimen described here as new, Gerronema schusteri Sing. n. sp., named for its collector, R.M. Schuster, and considered to be closely related to Gerronema fibula (Bull. ex Fr.) Sing.

B-11764
Ugolini, F.C.
ORNITHOGENIC SOILS OF ANTARCTICA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.181-193, 64 refs.

Penguin rookeries occurring on ice-free areas bordering the sea represent the most extensive source of organic matter for the Antarctic terrestrial ecosystem. Ornithogenic soils consist of a well-defined layer of guano resting sharply on mineral soil. Analysis of the

guano showed a high nitrogen content resulting from the high protein diet of the penguin. The phosphorus content was also high and mainly inorganic. The high salinity of the guano is due to the bordering sea, the penguin nasal excretions, and the aridity of the climate. Differential thermal analysis of guano, algal, and moss materials showed distinct differences in the thermoreactivity of the organic components. X-ray analysis revealed few differences in the clays of the mineral horizon underlying the guano and the soils uncontaminated by guano. The sharp separation of the guano layer and the underlying mineral soil indicates little frost mixing. The recognition of specific characteristics of soils associated with guano deposits may be important in locating and identifying relict or buried ornithogenic soils; dating the guano of these soils may have a bearing on the glacial history of the continent.

B-11765
Cameron, R.E.
MICROBIAL AND ECOLOGIC INVESTIGATIONS IN VICTORIA VALLEY, SOUTHERN VICTORIA LAND, ANTARCTICA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.195-260, Bibliography p.251-260.

Soil microbial and ecologic studies were made on soil samples from 11 sites in Victoria Valley. In situ environmental measurements were made for soil and/or air temperature, relative humidity, wind profile, evaporation rate, and solar, global, and net exchange radiation flux. Soils were analyzed or characterized for physical, physicochemical, and chemical properties. The abundance, distribution, and kinds of microorganisms were determined, and microbiology was correlated where possible with microclimate, soil, and other features of the sites and surrounding terrain of the dry valley environment. The soilclime, characterized by favorable temperature, and available moisture are important factors in the survival and growth of microorganisms. Soil diphtheroids Corynebacterium spp. and Arthrobacter spp. were the most prominent organisms.

B-11766
Thompson, J.C., Jr.
CILIATED PROTOZOA OF THE ANTARCTIA PENINSULA. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.261-288, 39 refs.

From Dec. 17, 1968, to Feb. 5, 1969, extensive collections of ciliated protozoa were made within a 40-mi radius of Palmer Station on Anvers I., Palmer Archipelago, near the Antarctic Peninsula. Limited collections were made from Deception I. and King George I. in the South Shetland Is. Samples were taken from melt water pools, fresh-water lakes, tidal pools, and marine waters. The ciliates encountered were cultured, fixed, and stained by the Chatton-Lwoff silver nitrate impregnation technique. Twenty-five genera representing seven orders were recorded. Detailed descriptions of 24 of these ciliates and limited descriptions of seven additional forms are given. Four species of these antarctic ciliates are described as new to science. Cyclogramma semimembrella, Anthrophilus antarcticus, Uropedalium antarcticum, and Parauronema antarcticum. Seven genera are new records for Antarctica: Furgasonia, Strombidium, Uropedalium, Paramecinema, Diophrys, Urostyla, and Fleurotricha.

B-11767
Gless, E.E.
LIFE CYCLE STUDIES OF SOME ANTARCTIC MITES AND DESCRIPTION OF A NEW SPECIES, PROTEREUNETES PAULINAE (ACARI: EUPODIDAE). American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.289-306, 11 refs.

Information acquired at Hallett Station during three austral summer seasons (Oct. through Feb. of 1965-1968) relating to the biology of four species of antarctic mites is presented. The species studied include Stereotydeus belli (Trousessart, 1902); Eupodes wisei Womersley and Strandtmann, 1963; Coccornagidia gressitti Womersly and Strandtmann, 1963; and a new species of the family Eupodidae, Protereunetes paulinae. The time spent in the various stages of development and the techniques of rearing are presented. The morphological changes characterizing each stage have been determined and are also presented. All stages of the new species Protereunetes paulinae are described.

B-11768
Young, S.B.
SUBANTARCTIC RAIN FOREST OF MAGELLANIC CHILE: DISTRIBUTION, COMPOSITION, AND AGE AND GROWTH RATE STUDIES OF COMMON FOREST TREES. American Geophysical Union. Antarctic research series, Dec. 15, 1972 Vol.20, Llano, G.A. (ed), Antarctic terrestrial biology, p.307-322, Ohio State University. Institute of Polar Studies. Contribution No.215. 16 refs.

The southernmost forests in the world grow in Magellanic Chile, where forest species extend their range to within about 500 mi of Antarctica. The characteristic vegetation of this region is a dense evergreen rain forest consisting mainly of the evergreen beech Nothofagus betuloides. Low-grown alpine vegetation is also widespread, particularly on exposed areas and at higher altitudes. The distribution of the Magellanic rain forest is correlated with an oceanic microthermal temperature regime and high, constant precipitation. Thus true rain forest vegetation does not extend significantly east of the Andes. Age and growth rate studies conducted on most of the important tree species of the rain forest indicate that forest growth is slow and that many of the trees reach great age. Some specimens of Nothofagus betuloides are probably 1500-2000 years old. Growth rate is determined by genetic as well as environmental factors.

B-11779
Ray, C.
SUBMARINE ECOLOGY, ACOUSTICS, AND PARASITOLOGY OF ANTARCTIC SEALS. Final technical report, NSF Grants GA-234 & GA-768, Feb. 1968, 14p., Unpublished manuscript. 27 refs.

Material on the ecology, acoustics, behavior, thermoregulation, and parasitology of antarctic seals is compiled from published and unpublished sources. The trill voiced by mature males was found to be a territorial challenge. Little or no correlation exists between effective temperature and breathing and heart rates, except possibly for the pups, who had extremely high metabolic rates. Body temperatures at various points and the greenhouse effect of tanned skin are described. Logistics are emphasized more than actual research results, and it is concluded that true comprehension of the seals will require placement of scientists in the pack with icebreaker and helicopter support as well as at depth around and under the ice. While a year-

around program would be useful. the September-December period is the most important.

B-11783
Chen, C.
ECOLOGY AND PALECECOLOGY OF PLANKTONIC GASTROPODS IN THE SOUTHERN OCEAN. Progress report, Dec. 15, 1965-Dec. 14, 1966, NSF Grant GA-276, Palisades, N.Y., Columbia University, Dec. 1966, 24p., 13 refs.

A group of articles on ecology, distribution, anatomy, and presence in ancient sediments of planktonic gastropods in Antarctic waters. Pteropoda, Heteropoda, and Ianthina, the three major groups, show group and species diversities from antarctic to subtropic regions. Only pteropods appear in antarctic waters; heteropods are added in the subantarctic region; all are found in the subtopics. Species of planktonic gastropods are classified as antarctic, subantarctic, or subtropic according to their maximum concentration in relation to the antarctic and subtropic convergences. The pteropod species composition from the pelagic sediments is related to the various ocean currents of the overlying water column. They can be used as ancient climatic indicators of Pleistocene time.

B-11784
Chen, C.
THECOSOMATOUS PTEROPODS AS INDICES OF MIXING WATER MASSES IN THE ANTARCTIC SEA. Chen, C., Ecology and paleoecology of planktonic gastropods in the Southern Ocean, Progress report, Dec. 15, 1965-Dec. 14, 1966, Columbia University. Lamont Geological Observatory, NSF Grant GA-276, Palisades, N.Y., 1966, 2p., Appendix III, 1 ref.

Thecosomatous pteropods, the major group of planktonic gastropods in Antarctic waters, are studied as an index of mixing water masses. Plankton tows were taken in two groups of thecosomatous pteropods defined according to the maximum concentration of indigenous species; the mixing ratio of the two groups is offered as an index of horizontal and vertical mixing of water masses (antarctic and subantarctic). Characteristics and movement of these masses are described. Antarctic surface water is found to be more influential in winter than in spring.

B-11790
Bunt, J.S. , Lee, C.C.
DATA ON THE COMPOSITION AND DARK SURVIVAL OF FOUR SEA-ICE MICROALGAE. Limnology and oceanography, May 1972 17(3), Miami University. Rosenstiel School of Marine and Atmospheric Science. Contribution No.1535, p.458-461, 14 refs.
GC1.L5

Changes in carbon and pigment content of four species of microalgae isolated from antarctic sea ice were followed over a period of 6 months, the first 3 in the light and the last 3 in complete darkness. With one exception, all organisms retained their viability throughout even though the medium was not supplemented with organic substances capable of serving as nutrients. In another series of experiments, growth responses to organic supplements were variable and pigment composition also was affected.

B-11791
Lindsay, D.C.
LICHENS FROM VESTFJELLA, DRONNING MAUD LAND. Oslo. Norsk polarinstitutt. Meddelelser, 1972 No.101, 21p., 30 refs.

Thirteen lichens are reported from Vestfjella in the first known collection of plants from this area. Umbilicaria aprina Nyl., a rare northern hemisphere species, is reported from Antarctica for the first time. New combinations involve the transference of Pyrenodesmia mawsonii C.W. Dodge to Chiodecton as C. mawsonii (C.W. Dodge) D.C. Lindsay and Umbilicaria sponqiosa var. subvirginis Frey et Lamb to Umbilicaria aprina as U. aprina var. subvirginis (Frey et Lamb) D.C. Lindsay.

B-11795
Benson, R.H.
NEW CENOZOIC DEEP-SEA GENUS ABYSSOCYTHERE (CRUSTACEA: OSTRACODA: TRACHYLEBERIDIDAE), WITH DESCRIPTIONS OF FIVE NEW SPECIES. Smithsonian contributions to paleobiology, 1971 No.7, 25p., 12 refs.

Precise descriptions of the taxonomy, geographic distribution and morphology of five new species of the genus Abyssocythere are given with excellent photographs. Abyssocythere is distinguished from other trachyleberid genera by a unique pattern which divides its reticulum into six character complexes. One of the species, A. australis, was discovered on the Indian-Antarctic Rise about halfway between Australia and Antarctica at a depth of 3,390 m. It is distinguished from the other species by its relatively bold general surface carapace features. Twenty fossil specimens were discovered. The ecology of the species is blind, psychrospheric, abyssal.

B-11813
Jehl, J.R., Jr.
DISTRIBUTION OF MARINE BIRDS IN CHILEAN WATERS IN WINTER. Auk, Jan. 1973 90(1), p.114-135, 27 refs.
QL671.N9

The distribution and ecology of seabirds in the southern winter were studied in southern Chile between mid-May and early July 1970. Areas surveyed included coastal and offshore waters from the Strait of Magellan (55S) to Isla Chanaral (29S) and the offshore islands of Mas Atierra, San felix, and San Ambrosio. New information was obtained on northward movements of several species, including Pachyptila belcheri, P. desolata, Fulmarus glacialoides, Macronectes giganteus, Catharacta skua, Daption capense and several species of cormorants. Warmwater species that occur regularly in Chilean waters were virtually unrecorded. Nesting data were obtained for Pterodroma cooki and Sula dactylatra. Creagrus furcatus was encountered on three occasions and may wander regularly to Chilean waters. Puffinus assimilis, previously unrecorded on the west coast of South America, was found near Isla Chiloe; a breeding population in that area seems probable. The temperature distribution is tabulated for the major species encountered.

B-11814
Budd, G.M.
STATUS OF THE HEARD ISLAND KING PENGUINS IN 1971. Auk, Jan. 1973 90(1), p.195-196
QL671.N9

The colony of King Penguins at Vahsel Moraine, Southwest Bay, Heard I. doubled its population in 2 yr, from 17 breeding pairs in 1969 to 38 pairs in 1971. This increase is almost identical with that at Spit Bay between 1963 and 1965. A probable attempt to form a new

colony was seen at Mt. Aubert de la Rue, West Bay, 3 km north of the Vahsel moraine, where a solitary incubating King Penguin and five others, without eggs, were observed. The 1971 observations suggest that the King Penguin population of Heard I. is continuing to expand.

B-11816
Boyd, W.L. , Klubek, B.P., Boyd, J.W.
CLEAN WATER ECOLOGY IN THE POLAR REGIONS. U.S. Office of Naval Research. Naval research reviews, Nov. 1972, p.17-24, 11 refs.

The Office of Naval Research is sponsoring a series of biological tests and measurements in the Middle Salt Lagoon at Barrow, Alaska, which the Navy Arctic Research Laboratory uses for disposing raw sewage. The effects of sewage on public health, on lagoon ecology and on the ecology of the part of the Arctic Ocean connected to the lagoon during brief periods in the melt season will be analyzed. Previous studies of the viability of coliform bacteria in polar habitats have been conducted at Barrow, and at McMurdo Sound, Cape Royds, and Cape Hallett, Antarctica.

B-11854
Mauchline, J.
BIOLOGY OF BATHYPELAGIC ORGANISMS, ESPECIALLY CRUSTACEA. Deep-sea research, Nov. 1972 19(11), p.753-780, Numerous refs.
GC1.D25

An examination is made of the body sizes of species of euphausiids, mysids, copepods and chaetognaths living in different bathymetric zones. Bathypelagic euphausiids and mysids are shown to possess a much greater potential for attaining greater size than corresponding epipelagic species. Body size of copepods shows a potential increase down to depths of 1000-2000 m but, thereafter, there is a decrease in the potential size. Mesopelagic and bathypelagic chaetognaths are potentially larger than most epipelagic species. A comparison of the rates of growth of species in different latitudes, including Arctic and Antarctic species, suggests that in high latitudes the rates are lower or comparable and that increased body size is attained through increased longevity. The effects of the low temperature regime in the bathypelagic environment can be defined as possibly decreasing the rates of growth, increasing longevity, and so producing organisms of larger size, and, in some cases, preventing the attainment of sexual maturity.

B-11882
Cracraft, J.
CONTINENTAL DRIFT AND AUSTRALIAN AVIAN BIOGEOGRAPHY. Emu, Oct. 1972 72(4), p.171-174, 37 refs.
QL671.E5

A review of the recent geological literature on continental drift substantiates the view that the final separations of the Gondwana continents took place in the late Cretaceous or early Tertiary. Some groups of Australian birds probably arose in and dispersed through Gondwanaland before the final break-up. These birds include penguins, ratites, galliforms and suboscines. (Auth.)

B-11883
Abbott, I.J. , Simpson, K.N.G.
AVIFAUNAL AFFINITIES OF MACQUARIE, NORFOLK, PHILLIP AND LORD HOWE ISLANDS. Emu, Oct. 1972 72(4), p.178
QL671.E5

Secker (1971, RAOU Newsletter No.9) has queried the tendency for authors of books on New Zealand birds to treat the avifauna of Macquarie Island as part of that of New Zealand. His criticism rests on two objections: that Macquarie Island is politically part of Tasmania and that the avifaunas of Norfolk and Phillip Islands are illogically not treated as part of that of New Zealand. The first objection is believed to be irrelevant, because political boundaries are not avifaunal boundaries, and the second to be only partly correct. It is recognized that Macquarie Island is separated by an oceanic deep from the geological complex avifaunally as part of New Zealand, also that the avifaunas of Norfolk, Phillip and Lord Howe Islands have been influenced by those of Australia, New Zealand and New Caledonia, and ought not to be considered purely as part of the New Zealand avifaunal region.

B-11901
Cameron, R.E. , Morelli, F.A., Randall, L.P.
AERIAL, AQUATIC, AND SOIL MICROBIOLOGY OF DON JUAN POND, ANTARCTICA. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.254-258, 13 refs.

The unusual geochemical composition and associated physical properties of Don Juan Pond provide an important aquatic-soil interjacence ecosystem surrounded by a cold, barren, arid environment. Water is not lacking, and algae and associated microflora can grow at the stream inlet to the pond, but microorganisms do not grow in the pond per se, nor in moist soil equilibrated at low water activity of the pond. Achromobacter parvalus is presently the sole survivor in the pond, although it is not thriving there. However, since it is also found in the adjacent soil, it may eventually overcome biotically detrimental features of the pond, such as toxicity, high osmotic pressure, salt imbalance, low temperature, and water activity. The possibility also exists, shown by the presence of aerial microorganisms, that nonantarctic forms--for example, Bacillus spp--have been brought into the area of the pond, increasing the likelihood that adaptive forms will develop.

B-11903
Carryer, T.J. , Knox, G.A.
STUDIES ON ZOOPLANKTON-HYDROGRAPHIC RELATIONSHIPS WITH LATITUDE. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.260-261

For the last 2 years, the program of the University of Canterbury Antarctic Unit has included plankton research at Cape Bird. In addition, the under-ice plankton at the Ross Shelf annual ice boundary is being investigated. The aim of these studies is to qualitatively and quantitatively investigate the summer phyto- and zooplankton cycles in terms of chlorophyll, biomass, and numbers. Associated physical and chemical parameters, including temperature, light, and nutrients, also are being monitored. Based on an analysis of changes in these factors, a matrix type illustration of the plankton-environment relationships with advancing time is planned. Samples were collected during Eltanin Cruises 51 and 52 for distribution and density determinations, biomass and metabolism studies, and for collection material for the Smithsonian Oceanographic Sorting Center. The free-fall net used for sampling is described.

B-11910
Stonehouse, B.
ANIMALS OF THE ANTARCTIC; THE ECOLOGY OF THE FAR SOUTH. New York, Holt, Rinehart & Winston, 171p., 14 refs.
QL106.S76

Although the largest land animal on the Antarctic continent is no bigger than a housefly, Antarctica is surrounded by a rich ocean, dotted with islands and swarming with marine life. Color photographs, maps, and diagrams complement the text, which describes the Antarctic region, ocean, islands, birds, and mammals, and their interrelationships and growing importance to man.

B-11920
Zamorano G., J. , Osorio H., H.
CERTAIN ASPECTS OF ICHTHYOLOGICAL ACTIVITY SPONSORED BY THE INSTITUTO ANTARTICO CHILENO (INACH) DURING THE 26TH ANTARCTIC PROGRAM (1971-72). Algunas aspectos de la actividad ictiológica promovida por el Instituto Antártico Chileno durante la XXVI Comisión Antártica (1971-1972). Santiago de Chile. Instituto Antártico Chileno. Boletín, 1972 No.7, p.14-16, In Spanish.

A program of fish specimen collection in South Bay, Doumer Island, Palmer Archipelago is described. Attempts are being made to determine the nutrition and major ecological factors of fish, and numerous samples were taken for both study and preservation in museums. Collection was made during January and February, 1972. Several species are listed.

B-11921
Moyano G., H.I.
BENTHIC INVESTIGATIONS DURING THE 25TH CHILEAN ANTARCTIC PROGRAM. Investigación bentonica durante la XXV Comisión Antártica Chilena. Santiago de Chile. Instituto Antártico Chileno. Boletín, 1972 No.7, p.17-18, In Spanish.

Chilean benthic investigations in the areas of Deception Island, Chile Bay, and the South Shetlands have been undertaken to determine the conditions of fauna. Volcanic eruptions on Deception have had only a temporary effect on the fauna. The distribution of life throughout the area is briefly described.

B-11924
Hermosilla R., W.
CONFERENCE ON ANTARCTIC SEAL CONSERVATION. Conferencia sobre la Conservación de las Focas Antárticas. Santiago de Chile. Instituto Antártico Chileno. Boletín, 1972 No.7, p.32-33, In Spanish.

The International Conference on the Conservation of Antarctic Seals, held in London in 1972 in response to the decision of the Sixth Antarctic Treaty Consulative Meeting was marked by general agreement to preserve the seal population in its present condition. Antarctic seal species are Lobodon carcinophagus, Hydrurga leptonyx, Leptonychotes weddelli, Ommatophoca Rossi, Mirounga leonina, and members of the genus Arctocephalus. Only the first three can be hunted and these only from September to the end of February. Population estimates and geographic zones frequented by seals are given. Within each of these zones population studies will be undertaken under SCAR.

B-11926
Moreno Meier, C.
SOMATOMETRY AND NATURAL FEEDING OF HARPAGIFER GEORGIANUS ANTARCTICUS NYBELIN IN FILDES BAY, KING GEORGE ISLAND, ANTARCTICA. Somatometría y alimentación natural de Harpagifer georgianus antarcticus Nybelyn en Bahía Fildes, Isla Rey Jorge, Antártica. Santiago de Chile. Instituto Antártico Chileno. Boletín, 1971 No.6, p.9-12, In Spanish. 5 refs.

Harpagifer georgianus antarcticus Nybelin, common along the coast of King George Island, lives under rocks along with young Notothenia. Somatometric relationships between body and head length, of cranial proportions, and of fin sizes are charted. Alimentary habits do not change with sex or size - the only food is Amphipoda. Prey capturing adaptations in jaws and teeth are advanced. Previous descriptions and classification of the genus are included.

B-11944
Averintsev, V.G.
CHARACTERISTICS OF THE VERTICAL DISTRIBUTION OF POLYCHAETA (EPRANTIA) IN ANTARCTIC AND SUBANTARCTIC WATERS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.66-69, Translated from its Informatsionnyi biulleten', No.80, 1970. 20 refs.

Fish, sponge, isopod, and polychaetous worm populations are graphed according to depth. The largest number of species occurs at between 300 and 400 m except for polychaetes in the region of Patagonia and of the subantarctic islands of the Indian Ocean where maximum incidence occurs at 100 m. This inconsistency is ascribed to both present-day conditions and earlier glaciations in Antarctica (which apparently extended to present depths of 200-400 m). This assumption is supported by comparison of the eulittoral, sublittoral, and bathyal fauna with respect to species and generic composition. The place of the deep trenches on the East Antarctic shelf within the general picture of the fauna of the area is discussed, but conclusions are not given for lack of information. The Antarctic littoral is almost without life. Besides the littoral, four major zones of the Antarctic shore are distinguished - sublittoral (to 50-60 m., mactophytes); eulittoral (near the coast to 500 m., aphroditids and other polychaetes); bathyal (500-1,500 m., Eunicidae); abyssal (little data on fauna).

B-11956
Savich-Liubitskaia, L.I. , Smirnova, Z.N.
GRIMMIA PLAGIOPODIA HEDW. FROM EAST ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.97-98, Translated from its Informatsionnyi biulleten', No.80, 1970. 3 refs.

Distribution and physiology of the moss Grimmia plagiopodia Hedw. is discussed. Antarctic specimens include monoecious mosses with asymmetric capsules, ventricose at the base, sitting on short bent stems, and with mitriform galeae. Another variety of the same species has denser turf, shorter and blunter leaves with very small tips and, apparently, no capsules. This, according to Bartram, is only an ecological form of the species. The present study reports the finding of mosses in East Antarctica believed to be the same as Bartram's ecological form, namely G. plagiopodia var. antarctica Bartr. Along with predominately blunt leaves some shoots in the new specimens have acuminate leaves in their middle part, making them similar to the typical form of the species. Though now known to be widespread in Antarctica, whether or not the two forms are of the species is as yet undetermined.

B-11957
Tashpulatov, R.IU. , Ionin, A.I., Sedov, O.K.
PHYSIOCHEMICAL AND BACTERIOLOGICAL ANALYSIS OF FRESH-WATER LAKES IN THE SCHIRMACHER PONDS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.99-102. Translated from its Informatsionnyi biulleten', No.80, 1970. 8 refs.

Physicochemical water properties investigated included vertical temperature distribution, transparency, hydrogen ion nitrate, nitrite, ammonium salt, magnesium, lead, calcium concentrations, and odor. Seasonal variations in these indices are given. Bacteriological analysis of Lake Stantsionnoye showed numerous colonies of bacilli and algae. Lake Zub microorganisms differed somewhat. Population increased with cessation of meltwater inflow, suggesting that the microorganisms are psychrophilic. Seasonal population fluctuations are graphed. Lake Stantsionnoye water differs markedly from meltwater, probably mostly because of algae. Some bacteria may have entered the lakes as contaminants from the station near one lake.

B-11971
Nishiwaki, S.
APPLICATION OF AEROPHOTOGRAPHY TO THE POPULATION STUDY OF ADELIE PENGUIN. Antarctic record, Nov. 1972 No.45, p.105-111, In Japanese with English summary. 2 refs.

Aerophotography was applied in an attempt to count the number of Adelie penguins at the rookery on Rumpa Island near Showa Station, Antarctica. An attempt to determine fluctuations in the number of Adelie penguins at the rookery during their breeding season was unsuccessful, and only one photograph each of the rookeries could be taken on Feb. 14, 1971. Although the photographs obtained were not entirely satisfactory, a total number of 442 penguins was counted from the two photographs. Methods for future application of aerophotography to the population study of Adelie penguins are under consideration.

B-11974
Arnaud, P.M.
ECOLOGICAL NOTES ON ZANCLORHYNCHUS SPINIFER (TELEOSTEI, CONGIOPODIDAE) ON KERGUELEN AND ON ITS PREDATION BY GIANT PETRELS. Notes écologiques sur Zanclorhynchus spinifer (Teleosteen, Congiopodidae) aux îles Kerguelen et sur sa prédation par les Pétrels géants Macronectes spp.. Téthys, 1972 4(3), p.757-760, In French with English summary. 12 refs.

Three specimens of Zanclorhynchus spinifer were collected after having been wounded or killed by giant petrels close to the shore of Christmas Harbor (Kerguelen) in March 1970. It has been observed that giant petrels eat only the stomach contents of fish. Similar behavior is reported for giant petrels at Crozet (against Alepisaurus brevirostris crozetensis and chicks of Aptenodytes patagonica) and in Adelie Land (against chicks of Aptenodytes forsteri). This is interpreted as an adaptation to seasonally unfavorable nutritional conditions; seasonal necrophagy has already been noted for antarctic invertebrates such as the Asteroid Odontaster validus. The diet and migratory habits of Z. spinifer are reviewed.

B-11975
Arnaud, F.
COASTAL PYCNOGONIDES FROM SAINT PAUL AND AMSTERDAM ISLANDS (INDIAN OCEAN). Pycnogonides littoraux des îles Saint-Paul et Amsterdam (Océan Indien). Téthys, 1971 3(1), p.159-166, In French with English summary. 10 refs.

The shallow water species Tanystylum brevipes (Hoek, 1881), hitherto considered as endemic to South Africa, is reported from very old and new samples off Saint Paul and Amsterdam. T. brevipes is synonymized with T. paulovense Hodgson, 1914, which was the only pycnogonid recorded until now from Saint Paul Island. Two other species, T. brevicaudatum, Gage and Stock, 1966, and Anoplodactylus pygmaeus (Hodge, 1964) are first reported in Amsterdam waters, but they were collected from a ship water filter apparatus and are regarded as alien species. Tanystylum morphology is described.

B-11977
Arnaud, P.M.
SMALL COLLECTION OF GASTROPODA PROSOBRANCHIA AND PELECYPODA FROM PETERMANN ISLAND. Sur une petite collection de Gastéropodes Prosobranches et Pélécypodes de l'île Petermann (Antarctique). Téthys, 1972 4(2), p.429-436, In French with English summary. 21 refs.

A few specimens of Mollusca from Petermann Island were collected in the area of the Second French Antarctic Expedition's work from 1908 to 1910. Lamy's report on the Mollusca of that expedition is thus completed. This collection contains eight species (five Gastropoda, three Pelecypoda) collected between the surface and a depth of 300 m. Four species are added to the malacological fauna of Petermann Island; a list of the whole 25 is included.

B-11978
Arnaud, P.M.
LITHODES MURRAYI HENDERSON, 1888 (CRUSTACEA, DECAPODA, ANOMURA) ALONG THE COAST OF CROZET ISLANDS (SOUTHWESTERN INDIAN OCEAN). Lithodes murrayi Henderson, 1888 (Crustacea, Decapoda, Anomura) dans les eaux cotières des îles Crozet (SW de l'océan Indien). Téthys, 1971 3(1), p.167-172, In French with English summary. 10 refs.

The first record of Lithodes murrayi Henderson from Possession Island, Crozet, stranded alive by storm on the beach of American Bay is made. Measurements and morphological peculiarities of two males are compared with the four already known specimens from off Prince Edward and Macquarie Islands. Commercial possibilities due to its edibility are considered significant. At maturity the crabs are from 75 to 100 mm long. The reproductive period is preceded by upward migration to coastal waters.

B-11979
Beurois, J.
ALIMENTARY REGIME OF THE SPINY LOBSTER JASUS PAULENSIS (HELLER, 1862) FROM SAINT PAUL AND AMSTERDAM ISLANDS (INDIAN OCEAN). PRELIMINARY RESULTS. Régime alimentaire de la langouste Jasus paulensis (Heller, 1862) des îles Saint-Paul et Amsterdam (Océan Indien). Résultats préliminaires). Téthys, 1972 3(4), p.943-948, In French with English summary. 10 refs.

The stomach contents of spiny lobsters Jasus pauleusis from the Saint Paul-Amsterdam area at a depth of 10-50m. and the Amsterdam area at 1-3m. depth are studied. The considerable

variety of prey included invertebrates, algae, and bait. Jasus paulensis is omnivorous with vegetarian and scavenger tendencies; this confirms what is known from other species of the Jasus genus.

B-11987
National Audubcn Society, Halle, L.J., Peterscn, R.T.
[SPECIAL ISSUE ON ANTARCTICA]. Audubon, March 1973 75(3), p.4-109

This issue of the Audubon is devoted to the natural history of the Antarctic as observed by the authors during visits there. Six articles by Halle describe the Antarctic continent and its outlying realm of ice and ocean; a desert island; seals; penguins; and sea birds. The past, present, and future of conservation in the Antarctic is discussed in an article by Peterson. Many color photographs located from scurces around the world are included as are two specially ccmmissioned double-gatefold paintings -- of all the world's penguins, by R.T. Peterson, and of the birds of the southern seas, by A. Singer.

B-11988
Arnaud, P.M. , Beurois, J., Noel, P.
PORTUNIDAE AND GRAPSIDAE FROM SAINT PAUL AND AMSTERDAM ISLANDS, INDIAN OCEAN (DECAPODA, BRACHYURA). Portunidae et Grapsidae des îles Saint Paul et Amsterdam, Océan Indien (Decapoda, Brachyura). Beaufortia, June 15, 1972 20(259), p.7-14, In French with English summary. 10 refs.

The first record of Ovalipes trimaculatus (de Haan, 1833) from Saint Paul Island means a large eastward extension of the previously known distributicn of the species (South America, Tristan da Cunha, and South Africa). Some pelagic Grapsidae from Amsterdam Island are regarded as conspecific with the specimens of Pachygrapsus sp. recently described from Tristan da Cunha Islands by Holthuis and Sivertsen and identified as Planes marinus Rathbun, 1914, a species new to the Indian Ocean. Lepas anatifera anatifera is recorded as epizoic on a pereiopod of this latter brachyuran. Morphology, geographic distribution, and interspecies differentiation of the above-mentioned crabs are discussed.

B-11989
Arnaud, F.
PYCNOGONIDS FRCM THE KERGUELEN ISLANDS (SOUTH INDIAN OCEAN): NEW DATA AND REVISION OF SPECIMENS OF THE MUSEUM NATIONAL D'HISTOIRE NATURELLE DE PARIS. Pycnogonides des îles Kerguelen (Sud Océan Indien): matériel nouveau et révision des spécimens du Muséum national d'Histoire naturelle de Paris. Paris. Muséum national d'histoire naturelle. Bulletin, July-Aug. 1972 65(3), p.801-815, In French with English summary. 19 refs.
QH3.P22

New Pycnogcnid specimens from Kerguelen Islands permit the revision of old material preserved in Paris. Five of the ten species reported are new to Kerguelen: Decolopoda australis, Austrodecus breviceps, A. curtipes, Nymphon biarticulatum, and Tanystylum oedinotum. All ten species were collected in the large Gulf of Morbihan where hydrological conditions vary considerably from East to West. In the western part, fresh and sea water mix, while the eastern part opens directly on the Indian Ocean. The number of species increases from West to East. Two groups of species are revealed, according to the substrates investigated: Colossendeidae and Numphonidae live on muddy bottoms, while Ammotheidae and Austrodecidae seem to prefer rocky bottoms with the associated algal flora. The importance of faunistic relationships between the various subantarctic islands and the Magellanic region is supported by new examples. The species of the genus Austrodecus no longer support the theory of a particular speciation for each subantarctic island, as suggested by Stock (1957). The Kerguelen Island shelf Pycnogonids, now totalling 18 species, have a complex origin, with 22 percent endemic species, a rather high rate.

B-11990
Arnaud, P.M. , Beurois, J.
FIRST RECORD OF THE GENERA CHARONIA AND RANELLA AT SAINT PAUL AND AMSTERDAM ISLANDS (INDIAN OCEAN) AND REVISION OF THE GENUS ARGOBUCCINUM (GASTROPODA CYMATIIDAE). Première signalisatiocn des genres Charonia et Ranella aux îles Saint-Paul et Amsterdam (Océan Indien) et révision du genre Argobuccinum (Gastropoda Cymatiidae) Téthys, 1972 3(4), p.865-874, In French with English summary. 17 refs .

First record of the genera Charonia and Ranella from Saint Paul and Amsterdam Islands and revision of the genus Argobuccinum (Gastropoda Cymatiidae) are made. On the basis of the redescriptiocn and new illustration of the species Bursa (Apollon proditor Frauenfeld, 1865, this form is here considered as a subspecies of the South American species Argobuccinum ranelliforme. The allied form from Tristan da Cunha and Gough Islands, described by Dell (1963) as A. proditor tristanensis is synonymized with A. ranelliforme proditor.. The probable coexistence of the latter subspecies with A. argus in South Africe would explain the so-called "slender variants" in South African waters. As a result the following recent taxa are now recognized in the genus Argobuccinum: A. argus (Gmelin, 1790), southern South Africa; A. ranelliforme ranelliforme (King, 1832), southwestern coast of South America; A. ranelliforme tumidum (Dunker, 1862), south of Australia; A. ranelliforme proditor (Frauenfeld, 1865), Tristan da Cunha, Nightingale and Gough Islands, Saint Paul and Amsterdam islands. Two other taxa are newly recorded from Saint Paul and Amsterdam. Charonia lampas pustulata (Euthyme, 1889), until now regarded as endemic of South Africa, and Ranella olearium (Linne, 1758). This last record fills the gap between the two geographical sectors where this species was already known (the first one being the North Atlantic-South Africa sector, and the second Australia-New Zealand). The three cymatiids discussed in this paper were caught in lobster pots and so may be considered necrophagous.

B-11996
INTERNATIONAL CONVENTION FOR THE CONSERVATION OF ANTARCTIC SEALS, 1972. Polar record, May 1972 16(101), p.271-278, Text of the Convention also appears in Polar record Sept. 1971, p.435-444.
G575.P6

The text of the Convention adopted at a conference held in London, 3-11 Feb. 1972 is presented. The following governments were represented: Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, Union of Soviet Socialist Republics, United Kingdom and United States. Measures adopted under the Antarctic Treaty of 1959 protect seals and other animals around the

shoreline of the Antarctic continent and the immediately off-lying islands, but do not give protection to the very much larger number of seals on the floating ice in the Southern Ocean. The new Convention fills this gap. The purpose of the Convention is to safeguard all species of Antarctic seals and to ensure that, if commercial sealing begins on the floating ice in the Southern Ocean, the killing of certain species will be prohibited and the taking of other species will be subject to strict limitations. This is the first time that governments have cooperated in working out measures to conserve populations of animals over a vast area before their existence has been jeopardized by commercial hunting.

B-11997
Laws, R.M.
SEALS AND BIRDS KILLED AND CAPTURED IN THE ANTARCTIC TREATY AREA, 1964-69. Polar record, May 1972 16(101), SCAR bulletin, No.41, May 1972, p.343-345, 1 ref.
G575.P6

Tabular data summarize the returns of mammals and birds killed or captured in the Treaty area during 1964-1969, based on statistics provided under Article XII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora. The six designated zones in the analysis area correspond with those used by the Internaticnal Whaling Commission. The results are an insignificant fraction of the permissible catches; thus, there is at present no serious direct threat to Antarctic seals and birds, although restricted over-exploitation of some local populaticns of seals is still a possibility.

B-12003
Johnstone, G.W.
REVIEW OF BICLOGICAL RESEARCH BY AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITIONS, 1947-71. Polar record, Sept. 1972 16(102), p.519-532, 4p. Refs. p.529-532.
G575.P6

Biological research by Australian National Antarctic Research Expeditions on seals, birds, invertebrates, and plant species is reviewed from the first expedition in 1947 to Heard I. to the end of 1971. Australia occupies five Antarctic and Subantarctic stations -- Casey, Davis, Heard I., Mawson, and Macquarie I. Intensive biological research has been carried out at Macquarie I. and although the station at Heard I. was closed in 1955, it has been revisited subsequently by ANARE and other expeditions. There is a pressing need for more research on and surveys of the huge populations of Antarctic seals, sea birds, and marine life. Sound recommendations for conservation and for the potential explcitation of these resources must depend on detailed knowledge of the life cycles, population dynamics, and food chains of this major ecosystem. In addition there are unique and as yet relatively unknown biotopes on the ice-free areas of the continental coasts and the interior. Future research will be directed to problems of this nature.

B-12005
Bandy, O.L.
ORIGIN AND DEVELOPMENT OF GLOBORATALIA (TURBOBCTALIA) PACHYDERMA (EHRENBERT). Micropaleontology, July 1972 18(3), p.294-318, 58 refs.

Studies of the morphology and ultrastructure of Globorotalia (Turborotalia) pachyderma (Ehrenberg) support the concept that this species arose from G. (T.) continuosa (Blow) in the uppermost part of Neogene zone 12. This lineage is quite distince from that leading from G. (T.) globorotaloidae (Colom) to the Neogloboquadrina dutertrei (d'Orbigny) group in the Upper Miocene. Preferential coiling ratois occur almost at the base of the range of G. (T.) pachyderma and are derived from those of its ancestor G. (T.) continuosa. Sinistral populations adjusted to cold polar waters, whereas dextral populations adapted to temperate waters, thereby providing one of the better planktonic indices of paleoceanography for the late Cenozoic. Antarctic, Arctic, and temperate area species are compared, and variations in growth patterns in geologic time are discussed. Globorotalia pachyderma belongs to the subgenusTurborotalia, the important and continuous stock of Cenozoic planktonic foraminiferans that gave rise to many lineages of the sharp-edged subgenus Globorotalia.

B-12006
Steenis, C.G.G. van
NOTHOFAGUS, KEY GENUS OF PLANT GEOGRAPHY, IN TIME AND SPACE, LIVING AND FOSSIL, ECOLOGY AND PHYLOGENY. Blumea, 1971 19(1), p.65-98, Bibliography p.95-97.

Data are presented from a detailed study of the ecology and taxonomy of the Nothofagus genus. A special chapter is devoted to a discussion of dispersal which appears to be extremely slow, with the implication that Nothogagus indubitably needs land for its spread, and has needed such for attaining its colossal range, encircling onwards of New Guinea the South Pacific (fossil pollen in Antarctica) to as far as southern South America. Another chapter is devoted to response of Nothofagus to the present climate. The possibility is envisaged that it could have grown along the border of the Antarctic Continent during a milder climate in the Cretaceous and Tertiary. The fossil record is ample, both by macrofossils and fossil pollen. Of the three pollen types, the brassii and fusca types are already found in the Upper Cretaceous in Australia, New Zealand, and Antarctica, and in the Eocene in Fuegia the menziesii type being found hitherto not earlier than the Lowest Tertiary. It is shown that the evolution and spread of Nothofagus can be explained in an unforced way under the steady state principle, which implicates that certain oceanic areas in the South Pacific have been land in the Cretaceous or Early Tertiary.

B-12008
Araya, B. , Arrieta, A.
BIRDS OF POTTER COVE, KING GEORGE ISLAND, CHILEAN ANTARCTIC - CENSUS AND DISTRIBUTION. Las aves de Caleta Potter, Isla Rey Jorge, Antártica Chilena - Censo y distribución. Revista de biologia marina, Nov. 1971 14(3), p.121-128, In Spanish with English summary. 5 refs.

Census of the avifauna of Potter Cove, King George Island, South Shetlands is given with a vertical and horizontal distribution of species and ecological discussion. Eight species are breeders and two visitors. A polar skua pair was found breeding here, at what is presumed to be the northern limit of its breeding area. Breeding areas are large, preventing over-populaiton of any species.

B-12054
Lozina-Lozinskii, L.K.

STUDIES CN CRYOBIOLOGY. ADAPTATION AND RESISTANCE CF ORGANISMS AND THEIR CELLS TO LOW AND EXTRA-LCW TEMPERATURES. Ocherki po kriobiologii. Adaptatsiia i ustoichivost' organizmov i kletok k nizkim i sverkhnizkim temperaturam. Leningrad, Nauka, 1972. 288p., In Russian. Refs. p.261-285.

The book deals with studies on the adaptation and resistance of single-cell organisms, poikilotherms (cold-blooded animals), and animal cells and tissues to low and extremely low temperatures in the Arctic and Antarctic. Among free-living arthropods cnly springtails and diptera were found as far as 85 S. Data are given on behavior and distribution of poikilotherms at zero and sub-zero temperatures. The super-cccling and freezing prccesses in cold-resistant crganisms, and survival after extra- and intracellular freezing are described. Chemical and mclecular changes, including injuries, in frczen and thawed animal cells are discussed.

B-12101
Korotkevich, E.S.
POLAR DESERTS. Poliarnye pustyni. Leningrad, Gidrometeoizdat, 1972, 420p., In Russian with English table of contents enclosed. 654 refs.

Polar ecology is comprehensively examined with emphasis on landscape development and the factors, such as climate, air and ocean circulation, recent glaciation, and soil formation, which influence it. Paleogeographic influence overlandscpae since the Proterozoic is examined. Climatic factors analyzed include radiation, wind, temperature, humidity, and the relationship between heat and moisture. Soil weathering processes are discussed and soil classified. All types of polar flora including microflora are discussed with ecological classification. A section on physiographic regionalization compares Antarctic regions with and without glacial cover. Particular attention is given thrcughout to geographical zoning and the evclutien of life within these zones. The text is liberally supported by maps and charts.

B-12106
Rosa, N.
SEA SQUIRTS: A RARE OLD BIRD IS THE PENGUIN. Oceans, Jan.-Feb. 1973 6(1), p.34-37

Penguin species, presently numbering 18, differ notably in size, but also in habitats, particular habits, and somewhat in appearance. The emperor is the only one of the species that requires the male to incubate the egg for 2 mo in the freezing Antarctic winter. Though the other 17 species require incubating chores of their males, they all breed in the springtime. Penguins spend up to two-thirds of their time in the sea and the balance on land; thus adaptation to two sets of temperature conditions is necessary. The morphology, environmental adaptation, navigating skill, and breeding and social behavior of the various penguin species are discussed and compared.

B-12109
Benedict, J.
ANTARCTIC FISHES: HOW THEY SURVIVE THE COLD. Oceans, Jan.-Feb. 1973 6(1), p.52-54

Antarctic fishes like those of the genus Trematomus -- T. borchgrevinki, T. Bernacchii, T. Hansoni, and T. loennbergi -- which spend their lives in sub-zero waters have been found to possess a glycoprotein in their blood sera with antifreeze properties. The glycoproteins are composed of amino acid residues, alanine and threonine, and sugar residues, N-acetylgalactosamine and galactose, and are present in the blood sera in 3 molecular weights: 10,500, 17,000 and 21,500. Recent work to clarify the mechanism by which the fish antifreeze lowers the freezing point of water and thus prevents ice from forming in the blood of Trematomus suggests that the glycoproteins bind to the surface of tiny ice crystals and stop their growth by preventing water molecules from settling on the ice crystal surface. It is possible that these glycoproteins may become useful experimental tools for investigating 1) the structures of water and ice, 2) the preservation of biological fluids and tissues in a frozen state; and 3) frost hardiness in plants.

B-12111
Ott, G.
SOARING SPIRIT OF THE SEA. Oceans, Jan.-Feb. 1973 6(1), p.61-68

The wandering albatross Diomedea exulbans, is a true bird of the sea. Except for nesting, it is completely independent of land. Weighing 20 lb or more, and with a wingspread greater than the Andean condor's the albatross glides and soars more effortlessly than any other bird. The abundance of seafood and the wind of the southern ocean which serves as a vehicle of transportation are elements essential to its survival. The flying capabilities, feeding and migratory habits, ecology, and breeding behavior of the the albatross are discussed. If the wandering albatross remains a flourishing species today, it may be due in part to Samuel Taylor Coleridge's Rime of the Ancient Mariner which created the legend of the bird's sanctity. Seafaring men even today hold to the belief that killing one of these birds will bring inevitable misfortune.

B-12112
Bregazzi, P.K.
LIFE CYCLES AND SEASONAL MOVEMENTS OF CHEIRIMEDON FEMORATUS (PFEFFER) AND TRYPHOSELLA KERGUELENI (MIERS) (CRUSTACEA: AMPHIPODA). British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.1-34, 72 refs.

Regular samples have been taken of two species of inshore sand-dwelling amphipod from the Antarctic. Females of Cheirimedon femoratus mature 3 years after release and produce one brood of about 70 eggs with an incubation period of about 6 months. Males reach maturity 15-24 months after release. Males and females of Tryphosella kerguelen mature about 3 years after release and females may produce up to four successive broods, each of between 4 and 18 eggs, at intervals of about 6 months. Growth and development rates of both species are slow when compared with those of temperate amphipod species. Over 90 percent mortality occurs within the first year after release in C. femoratus and rather less than this in T. kergueleni. There is negligible brood mortality in both species. Both species are taken in flesh-baited traps in large numbers except for early-stage juveniles, ovigerous females of T. kergueleni bearing late-stage broods, and ovigerous females of C. femoratus. A large proportion of plant material features in the diet of all stages of both species. Although overlapping for much of their life cycles, ovigerous females of both species release their broods in areas separate from one another, thus avoiding competition for food during the early juvenile stages. All categories of T. kergueleni appear to undergo a movement away from the brood release area during winter, perhaps in response to a diminished food

supply. A movement during winter is less pronounced in C. femoratus and appears to be restricted to developing females. The life cycle of C. femoratus is closely linked to the seasonal pattern of primary production, but that of T. kergueleni displays a large measure of independence from it. (Auth.)

B-12113
Thomson, M.R.A.
LOWER CRETACEOUS LAMELLAPTYCHUS (APTYCHI, AMMONOIDEA) FROM SOUTH-EASTERN ALEXANDER ISLAND. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.35-40, 12 refs.

Aptychi are described for the first time from Antarctica in sediments of Lower Cretaceous age on the south-eastern coast of Alexander Island. Two forms, both referable to Lamellaptychus, are present; one belongs to the group of L. seranonis (Coquand) and the second is probably new. (Auth.)

B-12114
Newton, M.E.
CHROMOSOME STUDIES IN SOME SOUTH GEORGIAN BRYOPHYTES. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.41-49, 34 refs.

Chromosome numbers are reported for 15 mosses and one liverwort from South Georgia and compared with reports from elsewhere. Although the highest chromosome numbers yet reported in species of Bartramia and Dicranella have been discovered in South Georgian material, the numbers of the other specimens examined show close agreement with those of related species in other parts of the world. It may be concluded tentatively that, in common with Arctic species, the indicence of polyploidy in Southern Hemisphere bryophytes does not increase with latitude.

B-12115
Thurston, M.H.
TWO NEW SPECIES OF ORCHOMENE BOECK (CRUSTACEA: AMPHIPODA) FROM THE FALKLAND ISLANDS, SOUTH GEORGIA AND GRAHAM LAND. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.51-63, 9 refs.

Two new species of Orchomene are described. O. schellenbergi sp. nov. is based on specimens assigned to O. macronyx (Chevreux) from the Falkland Islands, South Georgia and Graham Land collected by the Discovery Committee and the Swedish South Polar Expedition; O. tabarini sp. nov. is based on material from Graham Land collected by Operation Tabarin. O. macronyx is re-described from adult material in the Discovery Committee collections and compared with the two new species. (Auth.)

B-12116
Weller, M.W. , Howard, R.L.
BREEDING OF SPECKLED TEAL ANAS FLAVIROSTRIS ON SOUTH GEORGIA. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.65-68, 12 refs.

The speckled teal Anas flavirostris breeds at South Georgia where there are an estimated 40 to 50 birds in Cumberland East Bay, co-existing with the South Georgia pintail Anas g. georgica. It has not previously been recorded from South Georgia. (Auth.)

B-12118
Smith, R.N.
FREEZING RESISTANCE OF ANTARCTIC FISH: III. AN EXPERIMENTAL STUDY OF THE DEATH OF SUPERCOOLED FISH RESULTING FROM CONTACT WITH ICE. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.81-93, 21 refs.

Survival times of several species of supercooled Antarctic fish in contact with ice were conpared. Cloacal and muscle temperatures were measured, post-morten ice formation was studied and differences in behavior were observed. Variations were found in the freezing resistance of the different species, and the experimental observations were partly explained by the effect of blood solutes on crystal growth, the presence of structurally caused depressions of tissue freezing points and the behavior of the fish. The distribution of the various species studied at Signy I. and South Georgia was apparently well correlated with the variations in freezing resistance. When applied to biological materials and particularly in studies of freezing resistance, the normal definition of freezing point proved inadequate, since factors affecting the initiation and propagation of freezing must be considered. (Auth.)

B-12121
Corner, R.W.M.
OBSERVATIONS ON A SMALL CRABEATER SEAL BREEDING GROUP. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.104-106, 3 refs.

A breeding group of crabeater seals comprising a female with her pup and an adult male was observed over a period of 12 days at the Argentine Islands, Antarctic Peninsula. Other new records of similar groups are presented and their significance is discussed. (Auth.)

B-12122
Conroy, J.W.H. , Twelves, E.L.
DIVING DEPTHS OF THE GENTOO PENGUIN PYGOSCELIS PAPUA AND BLUE-EYED SHAG (PHALACROCORAX ATRICEPS) FROM THE SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.106-108, 15 refs.

Recoveries of a gentoo penguin and a blue-eyed shag from deep water are recorded. Identification of the food in this and four other gentoo penguins suggests that fish are an important part of the species' diet and they can dive to at least 100 m. to capture it. Diving durations and depths of other Antarctic penguins are discussed. (Auth.)

B-12123
Lewis, K.B. , Jenkins, C.
GEOGRAPHICAL VARIATION OF NONIONELLINA FLEMINGI. Micropaleontology, Jan. 1969 15(1), p.1-12, 22 refs.

Nonionellina flemingi (Vella) reaches reproductive maturity at earlier stages in lower latitudes. Adults from the continental shelf off northern New Zealand are small and trochospiral, while those from off the subantarctic islands are commonly twice the size and planispiral. The mean length and number of chambers in the final whorl of a local population is an inverse function of the temperature at which the animals are living. The relationship is used in a paleotemperature study of the New Zealand Upper Miocene to Recent. (Auth.)

B-12124
Boltovskoy, E.

LIVING PLANKTONIC FORAMINIFERA AT THE 90 E MERIDIAN FROM THE EQUATOR TO THE ANTARCTIC. Micropaleontology, April 1969 15(2), p.237-255, 38 refs.

The planktonic foraminiferal fauna was studied in 206 samples gathered at the 90 E meridian between the equator and the coast of Antarctica. Samples were collected throughout the water column from 1500 to 0 m. Twenty-seven species were recognized, and their horizontal and vertical distributions were established. Five types of surface water masses were distinguished on the basis of differences in foraminiferal fauna, and the geographical positions of these water masses were determined and plotted. It was found that differences exist between the geographic positions of the hydrological fronts established by means of temperature and salinity data, and those determined by means of foraminiferological data. Explanations for these discrepancies are given. The percentage of empty shells with respect to the total number of foraminiferal shells at different depths was calculated. (Auth.)

B-12125
Egorova, L.N. , Kopylenko, L.R., Maslennikova, N.V., Sidorova, E.M.
ANALYSIS OF THE AMINO-ACID COMPOSITION OF KRILL, AND KRILL MEAL. Issledovanie aminokislotnogo sostava krilia i poluchennoi iz nego kormovoi muki. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaista i okeanolografii. Trudy, 1970 Vol.73, p.179-187, In Russian. 9 refs.
SH1.M65

Data obtained in 1967 and 1968 on amino acids in fresh and pressed Antarctic krill, and in krill meal showed that krill has full-value proteins containing all important amino acids. During the desiccation process lysine and, in individual cases, arginine were destroyed, while other amino acids survived. According to the amino-acid composition, the proteins of krill meal do not differ significantly from those of high-quality fish meal from Caspian sprat.

B-12126
Egorova, L.N. , Treshcheva, V.I., Kabozov, S.M.
KRILL MEAL. Kormovaia muka iz krilia. Rybnoe khoziaistvo, 1962 38(3), p.70-72, In Russian.

Dried and ground Antarctic krill from the stomachs of whales contains as much proteins, fat, minerals, and vitamins, as fish meal from Caspian sprat. Tests for the nutritional value of krill meal were made by adding one of the three meals (krill, Caspian sprat and sunflower-oil cake) to the food of three groups of suckling pigs. The same weight increase resulted from krill and Caspian sprat meal. Thus, krill meal prepared by direct drying can be useful as animal feed.

B-12127
Lesel, R. , Therezien, Y., Vibert, R.
PRELIMINARY DATA ON THE INTRODUCTION OF TROUT TO THE KERGUELEN ISLANDS. Données préliminaires sur l'introduction de salmonides aux îles Kerguelen. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Oct.-Dec. 1971 No.57, p.3-24, In French. 14 refs.

The results of the introduction of trout to Kerguelen some years ago are analyzed. Two general types of nutrition were observed: one based on butterfly larvae, the other on aquatic animals. No feeding differences were apparent between fish of different species, size or sex. Growth rates are analyzed in detail for common trout, rainbow trout, and Salvelinus fontinalis. The value of introducing other fish, such as Atlantic salmon, into Kerguelen inland waters is discussed in view of the success of the trout experiment.

B-12128
Davine, P. , Derenne, P.
SURVEY OF THE RALLIER DU BATY PENINSULA. Reconnaissance sur la Péninsule Rallier du Baty. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Oct.-Dec. 1971 No.57, p.25-48, In French.

From Nov. 15 to Dec. 3, 1970, a survey of the Rallier du Baty Peninsula was carried out on foot. Observations on the morphology of rivers and lakes were made and water samples taken for later analysis. Mammal and bird populations were observed with emphasis on breeding, and invertebrate samples were taken. Equipment (listed) and camping techniques were thoroughly tested. The article is illustrated with numerous photographs of the terrain.

B-12136
Chuba, J.V. , Kuhns, W.J., Nigrelli, R.F., Vandenheede, J.R., Osuga, D.T., Feeney, R.E.
INHIBITION OF LECTINS BY ANTIFREEZE GLYCOPROTEINS FROM AN ANTARCTIC FISH. Nature, March 30, 1973 242(5396), p.342-343, 16 refs.

Tests for hemagglutination inhibition by plant lectins have demonstrated a distinct difference between active and inactive antifreeze fish glycoproteins. At a final concentration in the reaction mixtures of less than 1 microgm/ml the active antifreeze glycoprotein completely inhibited hemagglutination of both human and sheep erythrocytes. By contrast, the inactive antifreeze glycoprotein was some fifty to one hundred timess less active as an inhibitor. The active antifreeze and inactive antifreeze glycoproteins tested at 100 microgm/ml starting concentration failed to inhibit numerous other lectins as well as immune animal sera possessing various hemagglutinating specificities. The striking inhibitory activity of the intact active antifreeze glycoprotein for the Osage-orange lectin was further illustrated by the finding of little or no inhibitory activities by either the blood sera of man, rabbit, and a cool-water fish, the salmon, or preparations of mixtures of small glycopeptides produced by elastase hydrolysis of active antifreeze glycoprotein. Also, when live specimens of T. borchgrevinki were kept at 3C for periods of up to five weeks, the lectin-inhibition titres did not change, nor did the antifreeze activities of the blood. In comparative studies of inhibition with 11 different monosaccharides, three sugars with D-galactose configuration (N-acetygalactosamine, D-galactose, and 2-deoxy-D-galactose) and alpha - methyl-D-mannoside notably inhibited the Osage-orange lectin, decreasing in potency in the order indicated.

B-12140
Wallwork, J.A.
DISTRIBUTION PATTERNS OF CRYPTOSTIGMATID MITES (ARACHNIDA: ACARI) IN SOUTH GEORGIA. Pacific insects, Nov. 20, 1972 14(3), p.615-625, 5 refs.
QL461.P2

Nineteen species of Cryptostigmata are recorded from South Georgia. Records from over 300 samples taken from a range of microhabitats,

including moss, rock crevices, grass tussocks and nest material, on the main island of South Georgia. Bird I. and Willis I. show that distribution patterns within the area are influenced more by ecological, rather than geographical, factors. For the affinities of the South Georgoa Cryptostigmata, three main faunal elements are defined, namely an endemic element, an element South American in origin, and a circum-subantarctic element. These three elements occur in approximately equal proportions. A comparison between the South Georgia fauna and that of the maritime Antarctic to the east and south indicates that the maritime zone cannot be regarded as a distinct faunal province, as far as the Cryptostigmata are concerned, for there is a broad overlap between the species composition of this zone and that of South Georgia. (Auth.)

B-12141
Robertson, C.J.R. , Kinsky, F.C.
DISPERSAL MOVEMENTS OF THE ROYAL ALBATROSS (DIOMEDEA EPOMOPHORA). Notornis, Dec. 1972 19(Pt.4), p.289-301, 20 refs.
QL671.N65

An analysis of 122 recoveries of banded Royal Albatrosses of both subspecies indicates a dispersal of non-breeding birds, with prevailing westerly winds from the breeding localities to winter feeding areas and then back to the breeding grounds. Evidence is given to show the progressive longitudinal movement of known age birds during the first twelve months of flight and the full circumpolar movement of this species in an easterly direction. (Auth.)

B-12147
American Geographical Society, Watson, G.E., Angle, J.P., Harper, P.C., Bridge, M.A., Schlatter, R.P., Tickell, W.L.N., Boyd, J.C., Boyd, M.M.
BIRDS OF THE ANTARCTIC AND SUBANTARCTIC. American Geographical Society. Antarctic map folio series. Folio 14, New York, 1971, 18p. + 15 plates, 835 refs.
G3100.A4

This map folio consists of a short text and 15 plates. The text includes sections on the Zoogeography of the region and explains why the Antarctic region supports such a rich and numerous avifauna. The distribution of the species in various life zones and a species account are given. Fourteen of the plates are species distribution maps. For most of the species, particularly penguins, albatrosses and petrels, each species is given a separate map. In addition to the maps, a list of geographic locations and a list of over 700 references used in plotting the maps are given. The final plate is a series of photographs of the birds.

B-12148
American Geographical Society, Dewitt, H.H.
COASTAL AND DEEP-WATER BENTHIC FISHES OF THE ANTARCTIC. American Geographical Society. Antarctic map folio series. Folio 15, New York, 1971, 10p. + 5 plates, 117 refs.
G3100.A4

The fishes which are considered in this map folio comprise all the benthic species which have been recorded from south of the Antarctic Convergence, together with those species recorded from the isolated islands lying near it In addition, a few pelagic species which belong to families whose members are nearly all benthic are included. The text includes sections on the history of Antarctic ichthyogeography, limits of coverage, Antarctic fish fauna, their endemism and patterns of distribution, and the interrelationships of regions. Thirty-one maps showing the geographic distribution of fish species are presented in the final section of 5 plates.

B-12177
Voronina, N.M.
VERTICAL STRUCTURE OF A PELAGIC COMMUNITY IN THE ANTARCTIC. Oceanology, 1972 (Publ. Feb. 1973) 12(3), p.415-420, 19 refs. Translated from Okeanologiia.

The vertical structure of a community in the antarctic pelagic zone experiences regular changes in the course of a year. In the spring, the nucleus of a Calanoides acutus population occupies the highest position in the water and Rhincalanus gigas the deepest. At the end of summer, C. Propinquus is still in the same position, but the other two species change places. This succession is caused by the asynchronism of the cycles of the three species. At the end of summer, C. propinquus is still in the same position, but the other two species change places. This succession is caused by the asnychronism of the cycles of the three species. During the latter part of the growing period, the meridional differences in the seasonal state of the plankton are characterized by the existence of three latitudinal zones with the community possessing different vertical structures. (Auth.)

B-12178
Kriss, A.E.
QUANTITATIVE DISTRIBUTION OF HETEROTROPHIC BACTERIA IN THE DRAKE PASSAGE. Microbiology, July-Aug. 1972 (Publ. Jan. 1973) 41(4), p.648-652. Translated from Mikrobiologiia, Vol.41, No.4, 1972. 10 refs.

Microbiological studies, carried out in the waters of the Drake Passage and the adjoining Atlantic section of the Antarctic Ocean, showed the density of bacterial population (heterotrophs) to be higher here than in the same latitudes in other parts of the Antarctic Ocean, mainly in surface layers. The surface layer, rich in bacteria (waters of equatorial-tropical origin), is followed by a narrow layer with a low bacterial count (Antarctic waters), underlain in the zone of thermocline by a wider layer with an increased count of heterotrophs; the remaining space, down to the bottom, has a very low bacterial count (Antarctic waters). Waters that are equatorial-tropical in origin seem to be a branch of the Brazil Current.

B-12179
Kashiwadani, H.
ECOLOGICAL NOTE ON RINODINA ARCHAEOIDES IN ANTARCTICA. Hikobia. Journal of the Hiroshima Botanical Club, Oct. 1971 6(1-2), p.85-88. In English with Japanese summary. 9 refs.

Of the lichen species commonly observed on moss tufts in the Prince Olav Coast Rinodina archaeoides is most frequently found. This species has been reported from the Antarctic Continent, Arctic regions, and the Alps of central Europe. Moss tufts develop usually in the places where snow drift occurs, sometimes occupy a large area along small streams, and are light to dark brown in drier conditions. The color is believed to be caused by algae such as Nostoc and Gloeocapsa.

B-12195
Delepine, R.
MARINE VEGETATION IN WEST ANTARCTICA COMPARED TO THAT IN THE SOUTHERN FRENCH ISLANDS. BIOGEOGRAPHICAL SIGNIFICANCE. La végétation marine dans l'Antarctique de l'Ouest comparee a celle des Iles Australes Françaises. Conséquences biogéographiques. Société de biogéographie, Paris. Comptes rendus, 1966 No.374, p.52-68, In French. 18 refs.

The marine vegetation of the Melchior Islands on the Antarctic coast is compared with that of the southern French islands, with emphasis on the flora's biogeographical significance. Three groups with significant ecological and composition differences are defined: New Amsterdam Island, Kerguelen-Crozet, and the Antarctic coast. Seasonal variations were most important in the Antarctic coast region. The distribution of eight floral species is examined in light of water temperature, salinity, and other features of the Southern Ocean. Variations in ocean water are found to coordinate well with variations in plant types, forming three concentric regions around the Antarctic continent.

B-12197
Müller-Schwarze, D. , Müller-Schwarze, C.
DIFFERENTIAL PREDATION BY SOUTH POLAR SKUA IN AN ADELIE PENGUIN ROOKERY. Condor, March 1973 75(1), p.127-131, 7 refs.

In five different experiments, eggs and dead chicks of Adelie Penguins were laid out in three different regions (hill, center, and beach) of the rookery at Cape Crozier. The reactions of South Polar Skuas to these food items indicated differences of the combined predation and scavenging pressure on the penguins within the rookery. The breeding territories of the Skua are located at the landward edge of the penguin rookery ("hill"). The preying behavior of the territorial Skuas at that edge was less intense than that of Skuas which hunt in the center and beach areas of the penguin rookery. The Skuas never found eggs which were painted black, but eggs painted only half-black were eaten in most cases.

B-12198
Bougaeff, S.
PRELIMINARY NOTE ON PHYSIOLOGICAL DATA OF THE EMPEROR PENGUIN (APTENODYTES FORSTERI). Note préliminaire sur quelques données physiologiques enregistrées chez le Manchot empereur (Aptenodytes forsteri). Oiseau et RFO; 1972 Vol. 42 (Spec. issue)Exp. pol.fr.Missions P.-E. Victor. Publication, No.332, 1972, p.131-145, In French with English summary. 9 refs.

The results of a preliminary analysis of temperature and ECG data collected on Emperor penguins by the 20th French Polar Expedition are given. The ECG showed that the heart rate increases both during intense physical activity and in response to outside stimulation, but it is not affected by variations in environmental cooling power. (This point is analyzed in another paper.) Variations in stomach temperatures are caused by both environmental coolings and the ingestion of snow. Subcutaneous measurements on the limbs showed the flippers to be the penguin's main radiator. Convection is regulated, while standing, by the proximity of the upper side of the foot to the abdominal feathers. Postural adaptations are of great importance in regard to the incubation of eggs and protection of newborn chicks. Finally, the ECG of a non-captive penguin taken by telemetry and technical problems encountered in Adelie Coast are given.

B-12203
RADIOLARIANS OF THE WORLD OCEAN ACCORDING TO DATA FROM SOVIET EXPEDITIONS. Radioliarii Mirovogo okeana po materialam sovetskikh ekspeditsii. Akademiia nauk SSSR. Zoologicheskii institut. Issledovaniia fauny morei, 1971 9(17), 420p., In Russian with English table of contents. Refs.

QL121.A1A5

This volume contains two papers on biological studies carried out aboard the Vityaz', Ob' Vavilov and other scientific vessels of the USSR in the World Ocean, including the Antarctic Ocean, from 1959 to 1968. The morphology, ecology, geographic distribution, classification, and origin of two orders of Radiolaria, (Nassellaria and Spumellaria) are discussed. Included is a taxonomic scheme, and appended are a list of stations and their locations, and an index of the radiolarian Latin names. For abstracts of the two papers see B-12204 and B-12205.

B-12204
Petrushevskaia, M.G.
PLANKTONIC RADIOLARIANS NASSELLARIA IN THE WORLD OCEAN. Radioliarii Nassellaria v planktone Mirovogo okeana. Akademiia nauk SSSR. Zoologicheskii institut. Issledovanie fauny morei), 1971 9(17), p.5-294, In Russian. 197 refs.

QL121.A1A5

The morphology, ecology, geographic distribution, and taxonomy of 145 species and subspecies of the order Nassellaria collected by Soviet research vessels from plankton of tropical, temperate and antarctic regions are described. Data are given on environmental conditions, such as range of temperature, depth, and salinity, in which the majority of radiolarians were found. Antarctissa strelkovi n. sp. inhabiting waters S of the Antarctic Convergence was collected at temperatures down to -1.9 C. Nine species described are regarded as new. The classification of about 135 previously known species and subspecies is changed, and some 150 species are renamed. The study resulted in a new taxonomic scheme of Radiolaria. Hypotheses on the origin and evolution of radiolarians are discussed.

B-12205
Strelkov, A.A. , Reshetniak, V.V.
COLONIAL RADIOLARIA SPUMELLARIA IN THE WORLD OCEAN. Kolonial'nye radiolarii Spumellaria Mirovogo okeana. Akademiia nauk SSSR. Zoologicheskii institut. Issledovanie fauny morei, 1971 9(17), p.295-373, In Russian. 112 refs.

The results of examinations of over 620 plankton samples collected at 326 stations (65 in the Antarctic) by Russian scientific expeditions from 1959 to 1968 show 42 species and subspecies of colonial Radiolaria, Spumellaria, 7 of them proposed as new. The morphology, nutrition, ecology, geographic distribution, phylogeny, and classification of two families, Sphaerozoidae and Collosphaeridae are discussed. Three species of colonial radiolarians were found in plankton of antarctic waters: Acrosphaera spinosa, Collosphaera tuberosa, and Siphonosphera cyathina.

B-12206
Parker, B.C.
PROCEEDINGS OF THE COLLOQUIUM ON CONSERVATION PROBLEMS IN ANTARCTICA, HELD ON 10-12 SEPTEMBER, 1971, BLACKSBURG, VIRGINIA. Lawrence, Kansas, Allen Press, 1972, 356p., Refs.

Numerous case histories testify to the need for a firmer conservation policy to minimize man's impact upon Antarctica's natural environments, e.g., the near extermination of serveral whale species, the depletion of fur seals, and the discovery of residues of chlorinated hydrocarbon pesticides in Antarctic organisms at several trophic levels. Many of the present and future problems and their consequences confronting the conservation needs of Antarctic and its circumpolar waters are considered in the 23 papers presented at this colloquium. Those concerning whales and seals were barely touched upon as other organizations are already considering these issues. The contributions include useful information and ideas for evaluating the existing Agreed Measures and formulating new or improved international conservation policies in Antarctica. The conference focused primarily on the problems of U.S. bases and operations. Appended to this volume are the text of the Antarctic Treaty and recent Agreed Measures for the Conservation of Antarctic Seals taken from the Conference for the Conservation of Antarctic Seals, London, Feb. 3-10, 1972.

B-12207
Llano, G.
ANTARCTIC CONSERVATION: PROSPECTS AND RETROSPECTS. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.1-12

This colloquium is the first to bring together U.S. Antarctic Research Program workers for the sole objective of reviewing antarctic conservation practices and for examining these practices in terms of current problems and future needs. Although biologists initiated the colloquium, the presence of USARP investigators from the physical as well as the biological disciplines is an expression of the commonality of interests and purposes. Now that the National Science Foundation is responsible for funding both research and logistics, the cooperation and advice of scientists at the planning and developmental stages should minimize unfavorable changes to the Antarctic ecosystem. The Scientific Committee on Antarctic Research, established in 1958 to assist in framing scientific programs of circumpolar scope and significance, has established benchmarks of significant effort in biological research, conservation, and the protection of endangered species and natural areas. SCAR recommendations on conservation which are considered important to the objectives of this colloquium are presented. Of particular significance are Recommendations VI-4 to VI-9 of the Consultative Meeting held in Tokyo, Sept. 1970 pertaining to man's impact on the Antarctic environment, the use of radioisotopes, the coordination of investigations using isotopes, the effect of tourists and non-government expeditions, permits to specially protected areas, and conservation of fauna and flora.

B-12208
Wallen, I.E.
WHY PRESERVE THE ANTARCTIC?. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972. p.13-26

The application of ecosystem management concepts to the preservation of the Antarctic is discussed. The discussion includes a review of environmental factors in a variety of geographic areas. Environmental conditions which apply stress to ecosystems and thus reduce the number of plant and animal species include temperature changes; water chemistry; the use of insecticides, herbicides, or fertilizers; restriction of in-migration; floods; and cultivation. A loss of 10 or even fewer species in the Antarctic could leave no living representative of the species in many areas; thus individual species are especially important. Among the alternatives available for environmental management, the two most extensively used in the Antarctic are the establishment and maintenance of natural preserves and the protection of individual species by legal constraints. With the support of the Agency for International Development (AID), the Smithsonian Institution has undertaken a post-audit of selected actual and potential AID projects in a number of geographic areas from which it is expected that sufficient data relative to Antarctic conservation needs will be obtained to permit rational preservation of the Antarctic by evaluation and utilization of alternate techniques of management. The AID studies are summarized.

B-12210
Patterson, C.
LIMITING THE CONTAMINATION OF VIRGIN SURFACES OF FIRN BY ENGINE EXHAUSTS FROM NEARBY TRAVERSES AND OVERFLIGHTS. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.43-48

Vast regions of previously virgin firn have already been contaminated by lead and hydrocarbon pollutant emissions from local fuel exhausts dispersed in the surface layers as wide bands paralleling the paths of land and air vehicles. In an effort to implement ways to conserve the remaining virgin regions of firn in the Antarctic for geochemical studies, a group of scientists from the U.S., France, Belgium, and Japan attending the International Symposium on Hydrogeochemistry and Biogeochemistry in Tokyo, Sept. 1970, made the following recommendations: 1) that existing virgin firn zones be defined, taking into consideration the susceptability of different regions to contamination; 2) that the present Antarctic Treaty regulations pertaining to planning and reporting extended traverses be strictly adhered to; 3) that the Antarctic Treaty be amended to provide for an advisory group to recommend plans for traversing virgin firn areas; 4) that a new or modified SCAR subcommittee advise on conservation problems in virgin firn regions; and 5) that the conservation operations include the implementation of immediate geochemical studies in virgin firn areas scheduled for other types of investigations which may pollute the areas.

B-12211
Anderlini, V.C. , Connors, P.G., Risebrough, R.W., Martin, J.H.
CONCENTRATIONS OF HEAVY METALS IN SOME ANTARCTIC AND NORTH AMERICAN SEA BIRDS. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.49-62, 30 refs.

The results of the analyses for nine heavy metals in some Antarctic and North American sea

birds exhibited interesting differences. The two essential elements investigated, Cu and Zn, showed no significant geographical or species variation among the four populations of petrels. Distribution of individual levels about the mean for each tissue and each population was narrower than for the non-essential elements, indicative of metabolically regulated levels for Cu and Zn. Ag, Co. and Pb were difficult to detect at the low levels present in some tissues, and no marked variation among populations was apparent. Cd, Cr, Ni, and Hg levels in petrels suggest a correlation of increased concentrations of these potential pollutants with increased exposure to industralized areas. The consistently higher concentrations of these metals in the tissues of the Ashy Petral are probably a result of the proximity of this population to San Francisco Bay, a continuing and major source of agricultural and industrial pollutants. The data also suggest a pattern of slightly higher levels in the Wilson's Petral population nesting near Palmer station compared to the same species nesting near Hallett Station. The levels of the metals in the Snow Petrel can be assumed to represent natural (non-pollutant) concentrations. (Auth.)

B-12212
Risebrough, R.W. , Carmignani, G.M.
CHLORINATED HYDROCARBONS IN ANTARCTIC BIRDS. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.63-80, 27 refs.

Relative concentrations of the various chlorinated hydrocarbons were determined in a diverse variety of antarctic avifauna species in order to provide an indication of the pollution burdens of each of the major water masses. The present paper includes data accumulated to date on the chlorinated hydrocarbons of both agricultural and industrial origin found in the tissues and eggs of the Adelie Penguin, Wilson's Petrel, and Snow Petrel at Hallett Station, and the Adelie Penguin, Wilson's Petrel, Antarctic Tern, Giant Petrel, Brown Skua, and South Polar Skua at Palmer Station. Concentrations of DDT compounds in the Adelie Penguin eggs from Hallett were approximately the same as those in eggs from Cape Crozier obtained in 1967. No PCB was detected in either group. DDE levels in birds from Hallett and Palmer showed a twenty fold difference and PCB levels were about 17 times higher in the Palmer birds. Giant Petrels showed well-defined PCB peaks similar to that of the Wilson's Petral and both skuas contained relatively high concentrations of both DDE and PCB. Wilson's Petrels from Palmer were the most contaminated of the bird populations investigated in Antarctica. The possible sources of contamination are discussed.

B-12213
Dayton, P.K.
TOWARD AN UNDERSTANDING OF COMMUNITY RESILIENCE AND THE POTENTIAL EFFECTS OF ENRICHMENTS TO THE BENTHOS AT MCMURDO SOUND, ANTARCTICA. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.81-96, 21 refs.

At McMurdo Sound, Mycale acerata, the rossellid sponges, Perknaster fuscus antarcticus, Acodontaster conspicuus and Odontaster validus appear to be the foundation species. The form of pollution most likely to affect this community is organic enrichment and eutrophication from the garbage dump and sewer outfall. Any perturbation affecting the interaction between Mycale and its two major predators, Perknaster fucus antarcticus and Acodontaster conspicuus would probable have a relatively rapid and dramatic impact on the community. Odontaster validus is the "keystone" to the rossellid sponge-Acodontaster interaction, and the detritus-feeding O. validus population is almost certain to respond to organic enrichment with a sharp rise in numbers. There are predictable and important consequences to such a response, which will radically alter the facies of the community. As Odontaster and the rossellid sponges are common in other parts Acodontaster is at least present, it is probable that this group of foundation species, perhaps with different population levels, is a generally recurrent group over much of the Antarctic continental shelf. Thus, the pollution caused by organic enrichment could be a general problem eventually facing all the coastal Antarctic stations.

B-12215
Wohlschlag, D.E.
ECOLOGICAL CONSTRAINTS BY STRESSES. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.113-130, 27 refs.

Simple population models of the Antarctic fish Trematomus bernacchi and Dissostichus mawsoni are used to demonstrate the long-term effects of slight stress and to suggest some simple techniques of assessing stress effects on individuals in terms of growth and maintenance requirements. The models clearly show that assuming a constant recruitment, the effect of increased mortality on both numbers and masses is more accentuated in the longer-lived species in a given population. In natural populations, however, recruitment can be expected to vary considerably from year to year. It appears that sublethal stresses on ecosystems, communities, populations, individual organisms, and organic subsystems down to a biochemical level generally have a negating or depressing effect on the information, the energy, content, or the complexity of organization with the system in question. Evidence is presented to show that marine populations or ecosystems under stress such as elevated temperature, may reflect the stress through individual organisms with metabolic depression, with alteration of tissue and enzyme function, and with a decrease in activity. Life history phenomena in long-lived iteroparous species is discussed.

B-12216
El-Sayed, S.Z.
UNDERSTANDING THE ANTARCTIC MARINE ECOSYSTEM: A PREREQUISITE FOR ITS CONSERVATION. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.131-142, 20 refs.

In order to conserve the Antarctic marine ecosystem and to determine the effect of pollution or other forms of stresses on the ecosystem, it is important to know the structure and function of the ecosystem and how it responds to stressful conditions. It is suggested that such a study could be carried out by organizing several multidisciplinary cruises with a team of investigators whose correlated efforts would have the following objectives: a) determination of the trophic levels and estimation of the biomass tied up in each level; b) determination of the pathways and rates of flow of nutrient materials

and energy through the ecosystem; and c) measurement of the physical and chemical context within which the community is operating. Studies of the ecosystem were initiated aboard Eltanin Cruise 46 in Nov. 1970-Jan. 1971 and a sequel to this cruise is planned for Jan.-Mar. 1972 in the Ross Sea. It is further recommended that 1) the signatories of the Antarctic Treaty join forces with the UN agencies to enforce control of pollution from all sources; 2) monitoring stations be established at several locations and that these efforts be coordinated with the Global Monitoring System of the Ocean and the Atmosphere; and 3) the exploitation of whale stocks be carried out under the supervision of the United Nations.

B-12217
Parker, B.C.
CONSERVATION OF FRESHWATER HABITATS ON THE ANTARCTIC PENINSULA. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.143-162, 12 refs.

Studies are reported on the chemical, physical, and biological features of the Humble I. and Norsel Point ponds carried out during two summers of research in the Palmer Station area. In a survey of 17 freshwater habitats, approx 103 species and varieties of algae were recognized. The relatively eutrophic pond on Humble I. possessed higher concentrations of phosphate and ammonium than the oligotrophic Norsel Point pond. Experiments indicated that ammonium ion was the primary nutrient inducing the higher productivity in the Humele I. pond and that appreciable amounts of gaseous ammonia came from the Adelie penguin colony via the atmosphere. It is suspected that a microbiological breakdown of uric acid in penguin guana is responsible for much of the ammonia released. The findings suggest that a form of natural pollution (chemical eutrophication) of a freshwater ecosystem occurs in Antarctica and that this phonomenon involves interactions between sea, land, air, and fresh water. Suggested measures for conserving the freshwater ecosystems include the design of a continuous monitoring system for early detection of pollution, imposing limits of the numbers of individuals working in the field, and labeling some areas out-of-bounds for the increasing visits by tourists.

B-12218
Armitage, K.B.
NEED FOR CONSERVATION OF FRESHWATER ENVIRONMENTS. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.163-183, 55 refs.

Conservation of Antarctic freshwater environments is essential because: (1) lakes and ponds are monitors of environmental change that provides clues of past and present geological changes; and (2) the simplified aquatic ecosystems of the Antarctic are excellent natural laboratories for study of ecological theory, including eutrophication, the problem of limiting nutrients, diversity, stability, and the interaction of producer and consumer trophic levels. These scientific problems are basic to the world-wide pollution problems and an understanding of these scientific problems will contribute immeasurably to the solution of pollution problems. Any future conservation policy should include not only the preservation of unique freshwater ecosystems, such as the Victoria Land dry valleys lakes, but also allowance for planned experimental manipulations of ecosystems. (Auth.)

B-12219
Paterson, R.A. , Knox, J.S.
OCCURRENCE OF AQUATIC FUNGI IN VICTORIA LAND AND ROSS ISLAND. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.185-192, 28 refs.

Phycomycetes may well be the easiest organisms to use in the establishment of ecological bench marks or in the determination of the constituents of presently existing ecosystems. The occurrence of these fungi was investigated in 171 samples of soil and pond and lake water collected during Jan. and Feb. 1971 from Ross I. and the dry valleys. In addition to parasitic forms, saprobic aquatic Phycomycetes were frequently found in the McMurdo Oasis. These were present in soil and fresh water habitats. Members of the Chytridiales and Blastocladiales were found in 118 out of 171 samples. Forms of the Saprolegniales and Peronosporales occurred in 57 out of the 171 collections. Only three saprobic species of the Chytridiales were present in the samples. Two of these are distinctive and will be described as new species. The third species is Rhizophlyctis rosea Fischer which was found only in the McMurdo area and at Cape Royds and which was probably introduced to Antarctica by man. The one species of the Blastocladiales found in the McMurdo Oasis was Catenophylctis variabilis Karling. This keratiniphilic organism was the only Chytridiomycete found to occur on feathers of skuas and penguins. Oomycetous fungi were less common in occurrence than members of the Chytridiales and Blastocladiales. They were found in 57 of the 171 collections. One species of the saprolegniaccous genus Aphanomyces and two forms of Pythium were isolated.

B-12220
Schofield, E.
PRESERVING THE SCIENTIFIC VALUE OF COLD DESERT ECOSYSTEMS: PAST AND PRESENT PRACTICES AND A RATIONALE FOR THE FUTURE. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.193-228, 63 refs.

This paper reviews some of the unique characteristics of the terrestrial Cold Desert ecosystems and certain biological properties of algae, mosses, and lichens which enable their survival in this environment but which may make them susceptible to damage from the effects of man's activities in the Cold Deserts. Since water is scarce in the Cold Deserts contamination of precipitation and of other moisture sources is critical to many lichens and mosses which can absorb large amounts of water from the atmosphere, precipitation, or meltwater. Also, in regions where fixed nitrogen is scarce or present only in specific organic compounds, a situation that might favor organisms with special patterns of nitrogen nutrition over others, the introduction of vast amounts of foreign nitrogenous compounds undoubtly would induce changes in the macroflora and microflora. Finally, in regions where widespread salinity induces unsuitable conditions for organisms, introduction of additonal ions through industrial pollution (e.g., sulfates, nitrates, fluorides) will further reduce the available habitats. Since mosses and lichens are important primary producers in polar regions, they constitute a

major basis for all other life, and their destruction would affect whole communities of organisms, including mites, springtails, microscopic animals, protozoans, fungi, and bacteria. It is urged that wastes not be discarded in Antarctica but returned to the nonantarctic ecosystems from whence they came, or recycled at specific sites in Antarctica.

B-12221
Imshaug, H.A.
NEED FOR THE CONSERVATION OF TERRESTRIAL VEGETATION IN THE SUBANTARCTIC. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.229-240, 26 refs.

In the course of two centries of visits by man to the Subantarctic the Falkland I. fox, the only native land mammal, has been exterminated and over 20 kinds of alien mammals have been introduced. Many of these have survived and reproduced rapidly with the result that many of the natural ecosystems have been variously modified, or in some instances, completely destroyed. In the Kerguelen Archipelago selective grazing by rabbits, mouflon, reindeer, and sheep have almost eliminated certain palatable plant species. It is possible that these species may be replaced by vigorous and unpalatable alien plants. An effective program directed toward elimination of further introductions, control of existing populations, and elimination of alien mammals in limited areas after objective study must be established in the near future if the unique biota of the subantarctic islands are to remain available for future study.

B-12224
Shurley, J.T.
POLLUTION IN ANTARCTICA: I. THE ISLAND STATIONS WITH REMARKS ON SOME EMERGING PSYCHO-ECOLOGICAL VIEWPOINTS. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.257-266, 4 refs.

Environmental pollution is viewed as a consequence of man's social development involving large aggregates of people producing accretions of re-arranged materials that exceed the self-cleansing capabilities of natural systems. In Antarctica pollution occurs mainly at the stations and is closely related to the individual and group psychology of the occupants. Antarctica, lacking in warmth, light and comfort, is apt to evoke feelings of fear and hostility and become the object of plunder and guiltless, ruthless exploitation rather than mere exploration. Futhermore, Antarctica is a "non-territory", hence the protective and conservative instincts associated with man's territoriality are less likely to be brought into play. Men who go there are transients, not colonists -- renters, not owners, and apt to display the same unsympathetic and uncaring behaviors displayed in similar situations back in the urban society whence they came. Unless individual attitudes be modified by education and/or therapy, and the public stirred from its apathy toward conservation measures, Antarctica will continue to be another scene of human neglect and desecration.

B-12225
Cameron, R.E.
POLLUTION AND CONSERVATION OF THE ANTARCTIC TERRESTRIAL ECOSYSTEM. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.267-308, 57 refs.

Pollution and conservation of the antarctic terrestrial ecosystem are discussed from the viewpoint of soil microbiology. The Antarctic offers valuable study sites for analogies to possible extraterrestrial life detection. The results of physical, physiochemical, chemical, and microbiological analyses of soil samples collected from the streets of McMurdo Station are presented and compared with other relatively noncontaminated samples collected from other areas in the Antarctic. The discussion considers the contamination effects of nonindigeneous animals and plants, the permanent base at McMurdo and field camps as foci of contamination, and includes numerous photographs of contamination sources. In addition to these current sources, investigations have shown that foodstuffs, other expedition materials, and debris from early explorers contain viable, nonindigeneous microorganisms. In theory, there is no area of the Antarctic that has not been subject to possible microbial contamination. It is therefore speculative whether it is economical or practical to attempt any stringent measures for controlling the level of pollution beyond that which is extant.

B-12226
SUMMARY OF WORK GROUP EVALUATION OF THE EXISTING AGREED MEASURES. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.309-312, 1 ref.

In recognition of the fact that the existing Agreed Measures do not refer to ecosystems, this work group suggests that several portions of the text be reworded or supplemented to include the ecosystem concept. It is further recommended that a conservation officer be appointed to each major station and charged with the responsibility for enforcing the conservation provisions. His duties would include familiarizing all personnel with the conservation articles; reviewing research activities; assisting in the issuance of permits for scientific investigations in Specially Protected Areas; recommending the types of studies which might appropriately precede others; erecting signs warning personnel and tourists of the boundaries or locations of the Specially Protected Areas; and distributing maps of alternate visiting sites. It is also urged that advance notice be given of tourist visits and that conservation measures be applied mutually to Antarctic and subantarctic ecosystems.

B-12227
SUMMARY OF THE WORK GROUP ON MAN'S IMPACT ON ANTARCTIC ECOSYSTEMS. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.313-317

The recommendations of this work group include emphasis of the global benchmark concept in all treaties, operating procedures for visitors, or other factors affecting Antarctic areas; recording the introduction of all non-native matter to the Antarctic; monitoring air and water samples routinely and improving monitoring techniques; redefining tourists and accounting for their visits; substituting the continental shelf as a natural boundary for

offshore limits in terms of miles; protection and sensible utilization of Antarctic coastal marine and open sea resources; establishing standards for the disposal of solid and liquid wastes in nearshore areas and land-based operations; and continual assessment of all sources of pollution and contamination and their environmental impacts.

B-12228
SUMMARY OF THE WORK GROUP ON RADIOISOTOPE USE IN ANTARCTICA. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.318-319, 4 refs.

Regarding the use of radioisotopes in Antarctica it is recommended that Article V of the Antarctic Treaty include a statement encouraging investigators to condiser use of non-radioisotope methods whenever possible; that in the event radicisotope use is necessary, preference be given to those with short-lives and low particle energy levels; that the present methods and regulations concerning the use of radioisotopes by USARP scientists be reviewed by the Office of Polar Programs regarding matters of radiation safety officers, inspection of sites before and after use, special labs, etc; that information about the uses, types, amounts, and disposition of radioisotopes that have been used to date in the Antarctic be published; and that SCAR be invited to establish a committee to consider the uses, disposal, and monitoring of radioisotopes and other potentially toxic substances and to propose principles for their control which can be considered unde r the Antarctic Treaty. In addition to the recommendations an outline is offered for use by the Office of Polar Programs as a guideline to radioisotope use. These suggestions would be applicable to Subantarctic as well as Antarctic regions and could include other persistent, potentially toxic substances.

B-12229
SUMMARY OF THE WORK GROUP ON MONITORING POLLUTION IN ANTARCTICA. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.321-322

The scientific value of geochemical studies which aim at understanding atmospheric fallout patterns and global pollution necessitates the preservation of certain virgin firn areas on the Antarctic continent, which have not previously been, nor are expected to be traversed or flown over. One such area is a strip extending from the South Pole to Queen Maud Land which represents slope and plateau regions, both of which are desirable for geochemical and microbiological objectives. Progress might be enhanced by establishing an International Geochemical Subcommittee under SCAR, especially on trace organics, and charged with coordinating the technical design and experimental objectives of geochemical research. Biological monitoring might also be facilitated by a new subcommittee under SCAR and the compilation of the existing data on microorganisms. One approach might be to consider Antarctica as a cold desert "biome" with a marine interfacing. Palmer and McMurdo Stations are unique site locations for biological monitoring.

B-12232
Brownell, R.L., Jr. , Olazarri, J., Achaval, F.
MARINE MAMMAL AND BIRD OBSERVATIONS AND TRAWLING OFF URUGUAY: R/V HERO CRUISE 72-3A. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.9-10, 1 ref.

Hero Cruise 72-3a began at Buenos Aires, Argentina and operated in coastal Uruguayan waters between Punta del Este and just south of the Arroyo Chuy (the border between Uruguay and Brazil) from July 17-25, 1972. Observations were recorded on only five species of marine mammals: killer whale, Orcinus orca bottlenose dolphin, Tursiops truncatus franciscana (a dolphin), Pontoporia blainvillei; southern sea lion, Otaria flavescens; and South American fur seal, Arctocephalus australis. Species of birds recorded during the cruise were Magellanic penguin, Spheniscus magellanicus; great grebe, Podiceps major; black-browed albatross, Diomedea melanophris; giant fulmar, Macronectes giganteus; cape pigeon, Daption capense; prion, Pachyptila sp. (probably P. belcheri); white-chinned petrel, Procellaria aequinoctialis; sooty shearwater, Puffinus griseus; kelp gull, Larus dominicanus; brown-hooded gull, L. maculipennis; and South American tern, Sterna hirundinacea. Two other species were observed briefly once but not identified. One specimen each of D. melanophris, D. capense, and P. griseus was collected. Bottom specimens were collected at 22 stations between Cabo Castilo and just south of the Arroyo Chuy at depths between 7 and 24 m at distances of 1 to 21 km offshore. Preliminary results are summarized by phylum.

B-12238
Hnatiuk, R.J.
HYMENOPHYLLUM PELTATUM (POIRET) DESVAUZ, A NEW MACQUARIE ISLAND RECORD. New Zealand journal of botany, Dec. 1972 10(4), p.701-704, 12 refs.

The first record of the fern Hymenophyllum peltatum (Poiret) Desvaux on Macquarie I. is made, with a tabulation of its southern hemisphere distribution. It seems probable that H. peltatum became established on Macquarie from wind-blown spores. (Auth. mod.)

B-12241
Light, J.J. , Heywood, R.B.
DEEP-WATER MOSSES IN ANTARCTIC LAKES. Nature, April 20, 1973 242(5399), p.535-536, 11 refs.

Deep-water mosses were found growing in 6 to 12 lakes surveyed on Signy I., South Orkney Is. Two distinct communities were recognized. One, consisting of Amblystegium sp. or Pohlia nutans was limited to the relatively few areas of rock, stones and gravel existing at depths below 2 m. The cover was discontinuous and the colonies were attached firmly to the substrate. The second community, consisting of Drepanocladus occurred on mud and silt. The almost continuous cover often extended over areas of several square metres. In one lake, 40 percent of the bottom below 5 m was covered by a very luxuriant growth. Calliergon sarmentosum and Drepanocladus cf. aduncus occurred throughout the range of moss vegetation but the former was predominant in the shallower water and the latter at the greater depths. In this lake an increase in stem length with depth, ranging from 10-20 cm at 5 m to 30-40 cm at 10 m was observed. The mosses seem unable to withstand ice scour and no specimens were found where this could occur. Other factors apparently controlling inter- and intra-lake distribution were silting, substrate instability and annual light regime.

See also:
A-10054,A-10094,A-10354,A-10356,
A-10423,A-10648,A-10685,A-10999,A-11014,
A-11021,A-11727,A-11874,A-11961,D-10363,
D-10788,D-10797,D-10798,D-10990,D-11102,
D-11937,D-11938,E-10099,E-10200,E-10201,
E-10302,E-10303,E-10304,E-10305,E-10306,
E-10307,E-10313,E-10314,E-10323,E-10330,
E-10331,E-10386,E-10425,E-10429,E-10431,
E-10520,E-10818,E-10845,E-10887,E-11017,
E-11018,E-11019,E-11226,E-11309,E-11321,
E-11377,E-11470,E-11471,E-11472,E-11499,
E-11589,E-11838,E-11925,E-12007,E-12103,
E-12119,G-12222,G-12223,H-11327,H-11328,
H-11329,H-11488,H-12084,H-12088,H-12089,
H-12090,H-12091,H-12096,I-12038,I-12209,
I-12214,J-10117,J-10298,J-10299,J-10420,
J-10445,J-10447,J-10767,J-10774,J-10778,
J-10779,J-10780,J-10782,J-11149,J-11265,
J-11270,J-11345,J-11462,J-11525,J-11708,
J-11709,J-11710,J-11711,J-11712,J-11713,
J-11714,J-11865,J-11973,J-11982,J-12063,
J-12110,J-12131,L-11918,M-12154

C. CARTOGRAPHY

C-10026
Lazarev, G.E.
TRIGONOMETRIC LEVELING AND GRAVIMETRIC SURVEY IN ANTARCTICA. Trigonometricheskoe nivelirovanie i gravimetricheskie issledovaniia v Antarktide. 1970, 75p., In Russian.
TA609.L38

Results of studies carried out during the 4, 6, 9, and 12th Soviet Antarctic Expeditions in Antarctica show that the data on altitudes obtained by the trigonometric leveling method are more precise than by the barometric method. A study of the coefficient of refraction showed a variation from +0.1 during the day, to +3.5 and more at night. Data on gravimetric measurements made during the long-distance traverses in East Antarctica are summarized. The physiographic features under which astronomical and geodetic surveys were made are described.

C-10037
Swithinbank, C.W.M.
COMPOSITE SATELLITE PICTURES OF THE POLAR REGIONS. Polar record, May 1971 15(98), p.743-744, 5 refs.

Composite pictures of the polar regions were suppiled to the British Antarctic Survey by the United States National Environmental Satellite Service from November 1969 to July 1970. Ten-day composite minimum brightness pictures of the polar regions made from ESSA-9 satellite data and both shorter (5-day) and longer (30-day) sampling periods have also been used. The shorter period involves less averaging of ice boundaries since ice conditions do not change much in 5 days, but on the other hand it reproduces a great deal of cloud that cannot be distinguished from ice. A 30-day sampling may eliminate all clouds, but it suffers from the diffusion of ice boundaries over the distances they have moved during the period. A 10-day sampling offers a fair compromise, and there is no doubt that composite pictures of this kind are destined to replace the laborious manual compilation of hundreds of weekly ice charts. Another obvious application is for snow survey, and minimum brightness composites have been used to plot changing snow lines. Results compare well with conventional snow gauge data.

C-10059
Durand de Corbiac, H.
RECONNAISSANCE CHART OF THE KERGUELEN ISLANDS. La carte de reconnaissance des Iles Kerguelen. Comité national français des recherches antarctiques. CNFRA 1970 No. 26, 73 p.

Reconnaissance charts of the entire area of the Kerguelen Is. were prepared over a 4-year period, using data obtained at 100 geodesic points and 250 topographic stations, and 500 aerial photographs obtained in 500 hrs of helicopter flight. The island's geographic location, morphology and climate are briefly described and details of the chart preparation are given. The report includes some 40 pages of photographs, and charts of the littoral shelf, geodesic points, topographic stations, and a partial topography (Loranchet Peninsula).

C-10081
Lambert, B.P.
CARTOGRAPHY. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.23-52, 40 refs.
QC801.3.S6

Cartographic activities conducted in the Antarctic during the IGY period 1955-1960 are presented, including brief reviews covering the activities prior to 1945 and 1955. Eleven nations participated in widespread mapping of the continent, particularly in the areas of ice-free rock and other identifiable detail, and in the charting of much of the coastal waters and ocean south of 60 S. Index maps are presented showing the sheet lines of maps and charts published or revised during the IGY period by the respective nations, including Argentina, Australia, Belgium, Chile, France, Great Britain, Japan, New Zealand, Norway, the U.S.A., and the U.S.S.R.

C-10220
Fujiwara, K. , Kakinuma, S., Yoshida, Y.
SURVEY AND SOME CONSIDERATIONS ON THE ANTARCTIC ICE SHEET. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.30-48, 7 refs

This paper presents the procedures used for the determination of geographic position and ice surface elevations along the traverse route, subsequently plotted to show an ice surface topography which is subdivided into five areas. Position data (latitude, longitude, and elevation) were obtained for the segment between Showa Station and the Plateau Station during the 1967-68 traverse and for the Plateau Station and South Pole segment during the 1968-69 traverse. Measurements of ice surface elevation and topographic observations, i.e., surveying of surface slope and surface relief in sight, were carried out and results are summarized.

C-10270
Dittrich, G. , Schwarz, G.
GEODETIC SURVEY OF THE GERMAN GROUP DURING THE 7TH SOVIET ANTARCTIC EXPEDITION OF 1962. Die geodätischen Arbeiten der deutschen Gruppe während der 7. Sowjetischen Antarktis-Expedition 1962. Germany (Demokratic Republic). Nationalkomitee für Geodäsie und Geophysik. [Schriften], 1966 3(5), 112p., In German. 15 refs.

To obtain more precise data, geodetic surveys were run on the Mirnyy-Pionerskaya traverse by the Soviet Antarctic Expedition and also by a German group with the 7th Soviet Antartic Expedition in 1962. The results of studies carried out in 1957, 1958, 1960, and 1962 along the traverse are discussed. Data obtained from measurements of horizontal and vertical ice movement, snow accumulation , wind velocity, air temperature, and cloudiness at Mirnyy Station and from Mirnyy S. to a 100-km mark are tabulated and graphed. Refraction coefficients are derived from the triangulation and levelling methods used are considered. Details on the equipment are

given and the methods of operation are explained.

C-10358
Southard, R.B., Jr.
CARTOGRAPHIC ACTIVITIES OF THE U.S. GEOLOGICAL SURVEY. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.253-254

The antarctic cartographic effort of the Topographic Div. of the U.S. Geological Survey is concentrated primarily on completing the 1:250,000-scale reconnaissance topographic map series in western Antarctica. The maps in this series are intended as (1) bases for compilation and publication of multidisciplinary scientific data by USARP investigators; (2) source material for smaller scale mapping programs, such as the recently published American Geographic Society 1:5,000,000-scale map of the continent; (3) planning documents for future larger-scale mapping programs, such as the proposed Geological Survey 1:50,000-scale orthophoto project in the Wright-Taylor-Victoria Valley area of the Transantarctic Mountains; and (4) aids to logistic support. The Geological Survey has published 72 maps in the 1:250,000-scale reconnaissance topographic map series covering 769,225 sq km and seven sketch maps at 1:500,000-scale covering 859,100 sq km. In March 1971, a revised edition of the Index to Topographic Maps Antarctica was printed.

C-10359
Bushnell, V.C.
ANTARCTIC MAP FOLIO SERIES. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.254

The objective of the Antarctic Map Folio Series is to summarize the present knowledge of the Antarctic; the series will consist of some 20 folios, each devoted to one subject or scientific discipline. Three folios are scheduled for publication in the latter part of 1971, and a fourth should appear early in 1972. Thirteen folios are already in print. Folio 14, Birds of the Antarctic and Subantarctic, discusses geographical distributions and includes an extensive bibliography. Folio 15, Coastal and Deep-Water Benthic Fishes of the Antarctic, discusses the characteristics of antarctic fish fauna and the significance of the collection localities. A bibliography is included. Folio 16 is devoted to the morphology of the solid earth in the Antarctic and Subantarctic. Folio 17, Marine Sediments of the Antarctic and Subantarctic, includes maps of surface sediment type, sediment color, and ferromanganese deposits, distribution of fossil Foraminifera, sediment thickness for the Pleistocene based on radiolarian studies, fossil diatom distribution, and the total sediment thickness from seismic reflection data for the region westward from 60W. to 105E. A folio summarizing the history of antarctic exploration and scientific investigation is in preparation by staff members of the American Geographical Society. A final folio in preparation will include maps and graphs on antarctic mammals.

C-10360
Pinther, M.
NEW GEOLOGIC MAP OF ANTARCTICA. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.254

In August 1970, the American Geographical Society published Folio 12 of the Antarctic Map Folio Series entitled Geologic Maps of Antarctica (E-8351). In December of this year, the Society is publishing a Geologic Map of Antarctica on the scale of 1:5,000,000 with support from the National Science Foundation. This map is a synthesis, with modifications and more complete coverage, of the 18 regional maps at 1:1,000,000 or larger scale of Folio 12. The map is being printed in color. Besides geology, it also shows bathymetry and ice surface elevation, and it incorporates a list of supplementary references beyond those cited in Folio 12.

C-10369
GEOGRAPHICAL ACTIVITIES ON THE FRENCH SOUTHERN ISLANDS SINCE JANUARY 1965. Activités géographiques dans les Îles Australes Françaises depuis le 1er janvier 1965. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan-June 1970 No. 50-51, p.45-48, In French.

Recent cartographic work performed by the French National Geographic Institute up to 1969 is outlined. Maps available for the Kerguelen, Crozet and Amsterdam Islands varying in scale from 1/200,000 to 1/5000 are described, including details of terrain, vegetation, glaciers, and bathymetric topography obtained by reconnaisance, triangulation, photogrammetic, and sounding methods.

C-10370
Corbiac, H. de
PROBLEM OF MAPPING THE CROZET ISLANDS. Le problème de la carte des îles Crozet. France. Ministère d'Etat chargé des départments et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-Mar. 1971 No.54, p.3-38, In French.

A history of attempts at charting the Crozet Is. since their discovery in 1771 is given. In 1967, in preparation for a general reconnaissance program a preliminary chart was drawn on a 1/200,000 scale, based on all observations available at that time. The accuracy of various portions of that chart is very uneven. During the 3 seasons that followed (1968/69 - 1970/71) very little work could be accomplished because of unfavorable weather conditions. Suggestions are made for taking advantage of brief periods of acceptable work conditions in this area which is known to have the worst weather in the French Southern Territories.

C-10523
Great Britain. Directorate of Overseas Surveys
ANTARCTICA. POLAR STEREOGRAPHIC PROJECTION, SCALE 1:15,000,000. D.O.S. (Misc)135(Series 3101), 1963

The features appearing on the map include the Antarctic Convergence, Sub-tropical Convergence, ice coastline, ice front, glaciers, and areas of exposed rock, defined by bathymetric contours (interval 500 and 1000 m) and contours on ice (interval 1000 m). Traverse routes with heights in meters and the stations of Argentina, Chile, and the United Kingdom established in Graham Land are shown. Seven sources for the compilation of the sheet are listed.

C-10524
U.S. Geological Survey
INDEX TO TOPOGRAPHIC MAPS. ANTARCTICA. Washington, D.C., Nov. 1972
G9801.A2, 1968 .U5

Two series of topographic maps are available: Reconnaissance maps with shaded relief at 1:250,000 scale; basic contour interval, 200

m; sheet sizes, 26 by 30, 33, or 36 in., according to latitude. Reconnaissance maps with shaded relief at 1:500,000 scale covering coastal areas of Wilkes Land and Enderby Land. Basic contour interval, 1,000 ft with supplemental 500-ft contours in some areas; size, 25 by 33 in. In addition to the topographic series there is in preparation a sketch map series with shaded relief but without contours, at 1:500,000 scale. These maps will be recompiled and later published as part of the 1:250,000-scale topographic reconnaissance series.

C-10539
Law, P.G.
SURVEYING THE LAST CONTINENT. Cartography, Dec. 1970 7(2), p.76-87, 6 refs.
GA1.C3

The contributions of the Australian National Antarctic Research Expeditions to the exploration and surveying of the Antarctic continent are described. The discussion includes the history of cartographic activities on the continent; the techniques, instrumentation, and equipment used; and the many problems presented by the weather and physiography of Antarctica. The helicopter and various types of electronic distance measuring equipment have considerably simplified cartographic activities. Minor limitations are tellurometer readings obscured by drift snow scattering of radio waves, and helicopter load and distance restrictions. ANARE ships have carried out extensive coastal and hydrographic surveys. The hydrographic data have been compiled into charts for use of the nations navigating in Antarctic waters. Australian field survey parties have recently completed a Tellurometer-theodolite traverse from Mawson to Davis Station, totalling approximately 750 statute mi.

C-10632
Swanson, L.W. , Yeager, J.A.
NEW WORLD GEODETIC NETWORK. Polar record, Sept. 1971 15(99), p.863-870
G575.P6

As part of the National Geodetic Satellite Program, a 30-m diameter balloon PAGEOS (Passive Geodetic Earth Orbiting Satellite) was launched by NASA in June 1966. The Army Topographic Command has overall management of operations, the National Ocean Survey is responsible for technical direction, and 28 countries have co-operated in building a 45-station network, which connects all of the world's land masses, including Antarctica and many remote islands, with an accuracy within 10 m. Field observations have been successfully conducted at 8 stations in the Arctic and Antarctic, and these areas will now be accurately located with respect to the rest of the world. In Antarctica, Jamesway structures protected the equipment shelters and observations were conducted at temperatures as low as -48.6 C. Wind proved to be a major environmental problem at the Antarctic sites.

C-10637
FILLING IN ANTARCTICA'S BLANK SPACES. National geographic magazine, Feb.1963 123(2), p.297-298

The wide explorations of Antarctica, especially since the IGY have resulted in a map of Antarctica, produced by the National Geographic Society, which revolutionizes the conception of its geography. This latest Atlas Series Map, Antarctica, is highlighted by notes on the history of the continent from Jan. 17, 1773, when James Cook first crossed the Antarctic Circle, to completion of the first nuclear power plant at McMurdo Station on March 4, 1962. Further studies in the IQSY will be focused on the solar body while its magnetic storms are at minimum, and some of the most important observations will be from the vantage point of Antarctica.

C-10904
Koblents, IA.P.
NEW CARTOGRAPHIC DATA ON THE NORTHERN PART OF VICTORIA LAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.420-421, Translated from its Informatsionnyi biulleten' No.75, 1969. 5 refs.
Q115.S6862

Vertical-oblique air photo surveys made by the U.S. in 1963 and ground-based phototheodolite observations carried out by New Zealand in 1966-1967 served as a basis for new maps of the interior of Victoria Land. The maps give new data on geographic features of the area, not covered by the Soviet Antarctic Expedition in 1956-1958. Copies of the maps presented to the 13th Soviet Antarctic Expedition were studied and a comparison of the new and old maps is discussed.

C-10929
Forster, P.
TWENTY YEARS OF BRITISH SURVEYING IN THE ANTARCTIC. Chartered surveyor, May 1972 104(11), p.533-537, 10 refs.
TA501.R6252

British surveying in Antarctica since the 1950's is reviewed, developments in surveying and mapping techniques and modes of transport are described, and possibilities for the future are examined. The problems of polar survey during the past two decades have been considerably modified by the availability of mechanized surface and air transport, systematic aerial photography, and electronic distance measurement. British surveyors have concentrated almost entirely on the Antarctic Peninsula, the off-lying islands, and the mountains south of Halley Bay. Reconnaissance maps at a scale between 1:200 000 and 1:500 000 have been produced for these areas.

C-10958
Bugaev, IU.G. , Lazarev, G.E.
USE OF TELLUROMETERS IN ANTARCTICA. Antarctic (Antarktika), 1971, p.82-91, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva Nauka, 1966. 4 refs.

Specifications are given for a new continuous operation phase tellurometer which was used in Antarctica during the 1963-64 summer season with increased speed and accuracy. The measurable distance ranges from 0.15 to 30 km. The carrier frequencies may vary from 2700 to 3000 Mc/s, with a wavelength of approx. 10 cm. Formulas are given for the calculation of the length of a side, taking into consideration the temperature and atmospheric pressure. The accuracy of the tellurometer was tested on a geodetic quadrangle at the Pole of Inaccessibility, one vertex of which was set on a class-4 astronomical point. The relative error of a side was 1:160,000 without taking possible systematic errors into consideration. It has been proven, however, that tellurometer measurements can achieve great accuracy on the Antarctic ice cap as a result of the extremely low humidity. (For Russian original see C-5042)

C-10965
Dubovskoi, B.V.
DECADE OF SOVIET CARTOGRAPHIC STUDIES IN ANTARCTICA. Antarctic (Antarktika), 1971, p.188-262, TT 59C72, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966.

The scope of Soviet mapping in Antarctica is indicated by means of the following: (1) a map of the areas covered by surveys; (2) a map of the coverage of geographic and topographic maps; (3) a table of the quantity of aerial negatives obtained in various Antarctic regions from 1956 to 1962; (4) a table of Soviet maps compiled between 1957 and 1965, their scales, and their projections; and (5) a table of maps included in the Antarctic Atlas, with scales, projections, and the sources of data. The accuracy of Soviet mapping in Antarctica is demonstrated by comparisons with other maps covering the same territories. An appended table gives the names, geographical coordinates, dates of discovery, and origins of the names of approximately 500 geographical objectives discovered or photographed by the Soviet Union from 1956 to 1965. (For Russian original see C-5049)

C-11036
Gringorten, I.I.
SQUARE EQUAL-AREA MAP OF THE WORLD. Journal of applied meteorology, Aug. 1972 11(5), p.763-767, ref.

QC851.A66

The map is proposed for worldwide climatological statistics, to depict accurately the area covered by some specified meteorological condition or element. Since it is square, a grid overlay divides the map into small squares, each covering exactly the same amount of global area. The map is centered on the north pole where it is conformal. The parallels of latitude in each of the four quadrants of the square are represented by elliptical arcs that change from circular shape at either pole to a straight line at the equator. Except for Antarctica no continent is split or divided in this projection. The Northern Hemisphere is presented without interruptions or discontinuities of direction. The map's four quadrants can be reassembled to place the south pole and the whole of Antarctica at the center of the representation, as an interim step in the drawing of isopleths in the Southern Hemisphere.

C-11106
Langenegger, O.
TOPOGRAPHIC SURVEY. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966. Cape Town, Balkema, 1971, p.32-39, 12 refs.

QH199.5.S68

A closed triangulation network of sufficient accuracy to be plotted on a scale of I:50,000 was established over Marion I., leaving only the summit area inadequately surveyed. The coast-line and topographic details were largely obtained from aerial photographs. The position of the previously unnamed summit peak was determined approximately and its altitude calculated from barometer readings as 1230 m (4035 ft.). A similar map of the smaller hitherto unsurveyed Prince Edward I. was made and its highest point found to be 672 m (2205 ft.). Attempts to determine geographic co-ordinates for the two islands by sun observations were not entirely successful, but reliable values for Marion I. exist from a previous survey.

C-11174
de Schauer, S.B.K.
ANTARCTIC CARTOGRAPHY. Cartografia Antartica. Antartida, Dec. 1971 No.1, p.61-63, In Spanish.

International cartographic cooperation by the member nations of SCAR has resulted in a notable production of maps for use in scientific research below 60 deg S latitude. Major cartographic expeditions and events from 1901 to 1947 are mentioned. The reference library of the Instituto Antartico Argentino's Mapoteca contains some 2000 maps on the Antarctic region; this collection and the reference methods employed by Mapoteca are examined.

C-11291
Evans, S. , Drewry, D.J., Robin, G. de Q.
RADIO-ECHO SOUNDING IN ANTARCTICA, 1971-72. Polar record, May 1972 16(101), p.207-212, 10 refs.

As part of the preliminary studies of the region of Antarctica between 90 deg E and 180 deg, the results of the joint project of Scott Polar Research Institute and the National Science Foundation to map surface and bedrock topography forms are presented. Using a C-130 Hercules aircraft with antennas mounted beneath the wing, radio-echo soundings of the area were made in December 1971 and January 1972. Ice thickness measurements were obtained over more than 70 per cent of 60,000 km of flight lines. Three major relief zones are described: an extensive sub-ice mountain range, the "Gamburtsev Mountains", runs westward from Vostok station; the interior of Greater Antarctica forms a gently undulating lowland near to, but in places below, present sea level; sub-glacial topography of a zone adjacent to the exposed Transantarctic Mountains exhibits an irregular mountainous land surface 500 - 2500 m above sea level. Comparison between the results of this survey and those made during the Australian 1962-63 traverse from Wilkes to Vostok shows agreement to within an average of 7 per cent.

C-11340
Stroev, P.A. , Frolov, A.I.
SYSTEMATIC ERRORS IN THE ELEVATIONS DETERMINED BY SOVIET, JAPANESE, AND AMERICAN EXPEDITIONS IN EAST ANTARCTICA. K voprosu o sistematicheskikh oshibkakh v opredelenii vysot sovetskikh, iaponskoi i amerikanskoi ekspeditsii v Vostochnoi Antarktide. Morskie gravimetricheskie issledovaniia, 1970 Vyp.5, p.76-82, In Russian. 10 refs.

QB335.M6

Data on seismic and gravimetric measurements obtained at intersection points of traverses made by Soviet (1963-1964 and 1967), Japanese (1961) and American (1965-1966) expeditions are tabulated and compared. The difference in the mean heights at intersections of the Soviet and Japanese traverses was 310 m, and the difference in the gravity anomalies was about 140 mgal. A comparison of preliminary geodetic results obtained by an American expedition in 1965-1966 along the South Pole - Pole of Inaccessibility - Plateau Station traverses and by the 9th and 12th Soviet Antarctic Expeditions along the Molodezhnaya - Pole of Inaccessibility - Novolazarevskaya traverse shows systematic errors of +100 to 130 m in Soviet calculations.

C-11515
Maslennikov, A.S.
VISUAL-FREQUENCY RANGE-FINDER MEASUREMENTS IN ANTARCTICA. Svetodal'nomernye izmereniia v

Antarktide. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54
G860.S63

Data were studied on distance measurements made by the visual-frequency range-finders SVV-1 together with the white-light lamp DATS-50 or gas laser LG-56 at Molodezhnaya Station, at a point 730 km away from Molodezhnaya, and at the Pole of Inaccessibility in the daytime and at night from Dec. 1966 to March 1967. A comparison of the data shows that the range finder with the laser device can be effectively used for cartographic measurements, as well as for the diurnal, seasonal, annual and secular motions of the Earth, and in the atmospheric physical processes because of its high precision, low atmospheric refraction, and capability of usage in the daytime. Details of the instrument are given and the method of operation is explained.

C-11517
Egorov, G.V. , Lazarev, G.E., Maslennikov, A.S.
STUDY OF REFRACTION ON THE ACCURACY OF TRIGONOMETRIC LEVELING. Issledovanie vliianiia refraktsii na tochnost' trigonometricheskogo nivelirovaniia. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.279-283, In Russian.
G860.S63

Effects of the vertical refraction component on trigonometric leveling was measured daily at three points between Molodezhnaya Station and the Pole of Inaccessibility. Data on the variation of the refraction coefficient obtained at the stations are graphed and discussed. An analysis shows that the values of the refraction coefficient at the first station vary from +0.02 to +0.48 during a 24-hour period, with the greatest value at 00:00 and the least at 14:00. The maximal value of the refraction coefficient at the second station was +2.95 at 22:00 and the minimal was -0.003 at 14:00, and the refraction coefficient at the third station (Pole of Inaccessibility) was the greatest at 00:00 (+4.51) and least at 15:00 (+2.51). The high value of the refraction coefficient at the pole is due to the inversion phenomenon which occurs during clear, calm days with air temperature of about -40 C. A new method is discussed for refraction studies (three vehicles placed at different distances in one row) to determine the dependence of the refraction coefficient on both time of the day and distance between spaced vehicles.

C-11518
Lazarev, G.E. , Khman'ko, A.A., Bugaev, IU.G., Maslennikov, A.S., Egorov, G.V., Chertok, S.IA.
METHODS AND RESULTS OF TRIGONOMETRIC LEVELING IN ANTARCTICA. Metodika i rezul'taty trigonometricheskogo nivelirovaniia v Antarktide. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.284-312
G860.S63

Data were studied on polygon traverses obtained along: Mirnyy-Komsomol'skaya in 1959-1960, Komsomol'skaya-Sovetskaya-Vostok-Komsomol'skaya in 1961-1962, Vostok-Pole of Inaccessibility in 1964, and Molodezhnaya-Pole of Inaccessibility in 1967. The results show that the calculated data on the elevations were similar to the observed data. The methods of making observations and marking points, and equipment used for geodetic measurements are discussed. A catalog of the coordinates and point elevations along the traverses is given and 26 points are described.

C-11597
Southard, R.B., Jr.
TOPOGRAPHIC MAPPING FIELD OPERATIONS, 1971-1972. Antarctic journal of the United States, July-Aug. 1972 7(4), p.116-117
G845.A56

The first of two major projects, which were assigned and completed during the 1971-1972 field season, includes orthophotomapping in the dry valleys in the Transantarctic Mts. of southern Victoria Land bounded by 160 and 164E, 77 deg 15 min and 77 deg 45 min S. The primary objective was to establish horizontal and vertical control over the 6,000-sq-km area to support compilation of 8 orthophotomaps of 1:50,000 scale. A total of 133 hours of Navy helicopter support was provided during 42 days required to complete the work. The second project was carried out to determine the feasibility of using the Navy Navigational Satellite Systems as a means of establishing mapping control for traverse navigations, ice movement studies, and positioning return-beam vidicon imagery that will be obtained under the Earth Resources Technology Satellite program. The methods and equipment used for topographic mapping and the operation of the team are discussed.

C-11725
Southard, R.B., Jr.
CARTOGRAPHIC ACTIVITIES OF THE U.S. GEOLOGICAL SURVEY, 1971-1972. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.210-211, 2 refs.
G845.A56

Maximum effort during the 1971-72 period was directed toward completing the 1:250,000-scale shaded-relief map series. A revised edition of the Index to Topographic Maps, Antarctica, dated Mar. 1972, and a limited number of press proof copies of three 1:250,000-scale maps of Guest Peninsula, Alexandra Mts., and Boyd Glacier were printed. Maps in various stages of preparation include 18 1:250,000-scale maps of 230,000 sq mi along the Byrd Land Coast, 13 maps at 1:250,000-scale covering 170,000 sq km of eastern Ellsworth Land; a shaded-relief sketch map of Palmer Land at a scale of 1:500,000; a 1:1,000,000-scale map of the McMurdo Sound region; and a new edition of the Ross I. 1:250,000-scale map. A map of the Ross Ice Self has been compiled at scales of 1:1,000,000 and 1:2,188,800, covering the area from 77 to 87 deg 30 min S latitude and 150 deg W longitude to the Transantarctic Mts.

C-11729
Bushnell, V.C.
ANTARCTIC MAP FOLIO SERIES. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.214-215
G845.A56

The objective of the Antarctic Map Folio Series is to summarize the present knowledge of the Antarctic; the series will consist of some 20 folios, each devoted to one subject or scientific discipline. Two folios are scheduled for publication in the latter part of 1972, and a third should appear early in 1973. Fifteen folios are already in print. Folio 16 is entitled Morphology of the Earth in the Antarctic and Subantarctic, and Folio 17, Marine Sediments of the Antarctic and Subantarctic. Folio 18 will be devoted to antarctic marine mammals and Folio 19 will summarize the history of antarctic exploration and scientific investigation.

C-11734
Kruchinin, IU.A.
PREREQUISITES FOR PHYSIOGRAPHIC ZONING OF ANTARCTICA. Osnovnye predposylki fiziko-geofraficheskogo raionirovaniia Antarktiki. Geograficheskoe obshchestvo SSSR. Izvestiia, Nov.-Dec. 1972 104(6), p.430-435. In Russian. 16 refs.

Division of Antarctica into three topographical zones (shelf ice, continental slope, central area) and, for the last two, several subzones is described and illustrated with a map as the introduction to analysis of factors affecting the mapping of these zones. Snow cover, the most significant indicator of local conditions, fulfills the role played by the soil-vegetative cover on other continents. The three major components of Antarctic landscape (relief, climate, glaciers) are directly related to snow cover conditions. The effect of cyclones and other winds on snow cover distribution, the importance of snow cover surface features as an indication of relief (particularly in the center of Antarctica), and snow cover accumulation on the ice shelf are major factors in geographical zoning of Antarctica. The need for more accurate data for further refinement of Antarctic geographical zones is emphasized.

C-11986
Barrett, P.J. , Lindsay, J.F., Gunner, J.
RECONNAISSANCE GEOLOGIC MAP OF THE MOUNT RABOT QUADRANGLE, TRANSANTARCTIC MOUNTAINS, ANTARCTICA. U.S. Antarctic Research Program; Mount Rabot quadrangle, Antarctic map No.1, Washington, D.C., U.S. Geological Survey, 1970, 1 map

This map, the first in a new series, is multicolored and printed on the standard Geological Survey 1:250,000-scale reconnaissance topographic series map base.

C-12185
Kaplun de Schauer, S.B.
SOME ASPECTS OF ANTARCTIC CARTOGRAPHY. MAP COLLECTION OF THE ARGENTINE ANTARCTIC INSTITUIE. Algunos aspectos de la cartografia Antártica. La Mapoteca del Instituto Antártico Argentino. Buenos Aires. Instituto Antártico Argentino. Contribución, 1971 No.135, 10p., In Spanish with English, French, German and Italian summaries. 17 refs.

International cartographic activities are discussed relative to the different scientific disciplines that are being developed in the Antarctic. The standardization and systematization of a notable collection of specific charts resulting from this activity are also discussed. Finally, the organization and value of the elements that comprise the Map Collection of the Argentine Antarctic Institute are described. (Auth.)

C-12200
Lazarev, G.E.
TRIGONOMETRIC LEVELING AND GRAVIMETRIC SURVEY IN THE ANTARCTIC. U.S. Defense Mapping Agency Aerospace Center, St. Louis, Mo. Technical Translation Branch. [Translation], July 1972 DMAAC-TC-1842, AD-752 232, Translation of G.E. Lazarev, Trigonometricheskoe nivelirovanie i gravimetricheskie issledovaniia v Antarktike, Moscow, Nauka, 1970, 71p. Refs.

For abstract of the Russian original see C-10026.

See also:
A-10653,A-11873,B-12101,D-11218, D-11880,E-10319,E-11669,E-11967,F-10001, F-11516,F-11802,F-11807,F-12191,G-10097, I-10856,I-10857,I-10984,I-11334,I-11456, L-10970

D. EXPEDITIONS

D-10007
PPELIMINARY REPORT OF THE OVERSNOW TRAVERSE OF THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1969-1970. Antarctic record, Jan. 1971 No.39, p.39-45, In Japanese with English summary.

The oversnow traverse party of the 10th Japanese Antarctic Research Expedition was organized to accomplish the initial stage of "Glaciological research project of Enderby Land, Antarctica, 1969-1974" The party consists of two geologists, one geomorphologist, two glaciologists, one surgeon, two mechanics, one field assistant, and one cameraman. The party used four oversnow vehicles (two KD-60 and two KC-20), one plywood caravan equipped with six berths and galley, and nine wooden sledges. The maximum load during the traverse was 27 tons. The party left Showa Station on November 1, 1969 and returned on January 29, 1970, covering the following sites: 69-07S, 42-29E; 69-59S, 43-04E; 72-00S, 43-09E; A-group of Yamato (Queen Fabiola) Mts. (71-44S, 35-50E); D-group of Yamato Mts. (71-20S, 35-38E); and 70-51S, 43-07E. Scientific activities of the party were: (1) Astronomical observation. (2) Barometric altimetry. (3) Measurement of ice thickness by radio echo sounding seismography and gravity. (4) Geomagnetic survey. (5) Measurement of snow accumulation at stakes, pits and borings. (6) Observations of surface structures and sastrugi patterns. (7) Setting of strain grids at 6 sites. (8) Triangulation and levelling for the setting of strain grid band along the parallel of 72S (256km). (9) Observation of VLF. (10) Meteorological observations. (11) Field surveys for geology, geomorphology and glaciology in the Yamato Mts.

D-10041
Kusunoki, K.
GENERAL REPORT OF THE WINTERING PARTY OF THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1968-1970. Antarctic record, March 1971 No. 40, p.1-21, 17 refs.

An outline is given of the activities of the 10th JARE at Showa Station and its vicinities from Nov. 30, 1968 to April 8, 1970. The scientific programs covered 20 disciplines, most of them from the previous year. New programs included aerophotogrammetry, observations of auroral x-rays from high-altitude balloons, construction of sounding rocket launching facilities, observations of atmospheric electricity and infrasonic pressure waves at Showa Station and an inland traverse to the Mizuho Plateau and the Yamato Mts. Details of the research program, roster of personnel, expenitures, summaries of activities, and operational routines are given.

D-10108
Pavliuchenko, V.F.
FIRST EXPLORERS OF ANTARCTICA. (THE 150TH HOMECOMING ANNIVERSARY OF THE FIRST RUSSIAN ANTARCTIC EXPEDITION). Pervootkryvateli Antarktidy. (K 150-letiiu vozvrashcheniia pervoi russkoi Antarkticheskoi ekspeditsii. Sudostroenie, Aug. 1971 No.8(405), p.61-63, In Russian.

VM4.S8

This popular account of the first voyage from 1819 to 1821, to and around Antarctica by the Vostok and Mirnyy under the leadership of Bellingshausen and Lazarev is based on diaries of several members of the expedition. Data are given on the construction and dimensions of the vessels, names of islands discovered in Antarctic waters, and scientific observations carried out by the expedition. The date of discovery of Antarctica was Jan. 28, 1820, rather than Jan. 1821, as assumed earlier.

D-10115
Enloe, C.F., Jr.
LOG FROM THE ROSS SEA. Nutrition today, Autumn 1969 4(3), p.29-34, 36

An account is given of the author's trip to Antarctica, aboard the USCG Icebreaker Southwind to determine the feasibility of conducting a survey of the nutritional status of the men stationed on the continent. The climate, remoteness, transportation difficulties, laboratory facilities, and limited number of medical personnel available impose different conditions for undertaking the study the Navy's Bureau of Medicine and Surgery contemplates. It has been determined that such a survey is feasible and it will begin formally in Jan. 1970. The ship sailed southward from New Zealand, calling at Campbell I., crossing the Antarctic Circle, and breaking a trail through the ice pack of the Ross Sea to McMurdo. Highlights of the journey are given for the period Nov. 22-Dec. 9, 1968.

D-10123
Tolstikov, E.I.
SOVIET STUDIES OF ANTARCTICA. Radzieckie badania Antarktydy. Warsaw. Panstwowy Instytut Hydrologiczno-Meteorologiczny. Prace, 1970 No. 100, p.91-94, In Polish with Russian and English summaries.

QC989.P7W24

A brief description is given of the organization, research programs and results obtained by the Soviet Antarctic Expeditions during the period 1957-1969 in the following fields: meteorology, aerology, climatology, oceanography, atmospheric physics, glaciology, geology and biology. Studies were carried out at Mirnyy, Pionerskaya, Oazis, Vostok, Sovetskaya, Komsomol'skaya, Pole of Inaccessibility, Novolazarevskaya, Molodezhnaya and Bellinghausen Stations, as well as en route to and from Antarctica.

D-10130
Walczak, W.
SESQUICENTENNIAL OF THE ANTARCTIC DISCOVERY. W 150 rocznice odkrycia Antarktydy. Wszechswiat, Oct. 1970 No.10(2084), p.253-262, In Polish

QH7.W8

An account of the discovery, explorations and studies of the Antarctic is given. Narratives are presented for each of the major Antarctic expeditions through 1958. The IGY is

also discussed. Credit for the discovery of the continent is given to Bellingshausen without mention of other claimants.

D-10198
Finn, R. , Liss, H.
RONNE EXPEDITION TO ANTARCTICA. New York, Julian Messner, 1971, 96p.
G850.1946.R64
The objectives of the Ronne Antarctic Research Expedition, 1946-48, the last private expedition, led by Commander Finn Ronne (U.S. Navy), sailing in the diesel-driven Port of Beaumont, Texas were to discover and map the unknown interior of Antarctica south and west of the Weddell Sea, carry out scientific observations and experiments, and prove whether Antarctica was one or two continents. An account is given of the activities of the expedition, including its organization, the voyage to the Antarctic, preparation of men and equipment for the work ahead, life during the long winter night, and scientific exploration and discoveries. The accomplishments of the expedition included the exploration and mapping by land and air of more than 450,000 sq mi of new territory, more than half of which had never before been seen, the determination that Antarctica is one continent, and the performance of experiments in 11 branches of science, culminating in 14 reports.

D-10213
FAMOUS FLYERS: THE POLAR EAGLE. FAA Aviation News, Dec. 1971-Jan.1972, p.10-11
HE9761.1.F18
A popular account is given of the life and exploits of Richard Evelyn Byrd, the first man to see both ends of the earth from the air. Byrd's flight from Spitzbergen, Norway to the North Pole and return took a total of 9 hr compared with 429 days for Admiral Peary's overland conquest of the Pole. Byrd's expedition to the South Pole was comprised of over 100 men, nearly as many sled dogs, 4 ships, and 3 airplanes. His base camp, Little America, was located on the Ross Ice Shelf about 750 mi from the Pole. The historic flight over the South Pole was made on Nov. 29, 1929. Weight considerations and navigation during the flight are discussed.

D-10217
Murayama, M. ed
REPORT OF THE JAPANESE TRAVERSE SYOWA-SOUTH POLE, 1968-69. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, 279p., Numerous refs.
This report deals with the general outline and logistic records of the traverse as well as full data of the scientific observations. It gives the general outline of the round trip of the South Pole Traverse and the reports on the logistic problems such as transportation mechanics, telecommunication and equipments, and contains the results of scientific observations en route of ten different disciplines with an introductory remark and a medical report on the traverse members. The scientific disciplines cover glaciology, ice physics, ice chemistry, meteorology, gravimetry, geomagnetism and radio science. For the glaciological survey, both seismic and radio echo soundings were employed as techniques for measuring ice thickness. For abstracts of papers in the report see C-220; D-218-219; F-222, -224, -226; G-231, -232, -233; H-230, -234; I-221, -223; K-229; L-225, -227, -228.

D-10218
Maurayama, M.
GENERAL STATEMENT: JARE SOUTH POLE TRAVERSE 1968-69. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.1-22, 2 refs
Preparatory studies were completed in the 1st year by JARE 1966-67. The 2nd year's program, including a reconnaissance traverse and depositing of emergency supplies for the coming South Pole Traverse party was completed by JARE 1967-68. In the 3rd year, JARE 1968-69 opened a new traverse route to the South Pole from Showa Station and obtained considerable scientific data. The activities of the 3-year period are summarized and the background, preparations, field difficulties, equipment developments, and experience gained during that time are described.

D-10219
Fujiwara, K.
OUTLINE OF SCIENTIFIC PROGRAM AND ITS RESULTS. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.23-29, Ref.
The scientific program for the traverse included geodetic and geophysical investigations of the ice sheet, subglacial relief and crustal structure; meteorological and glaciological studies of the ice and snow; observations on geomagnetism and VLF emissions for the study of latitudinal variations; medical studies on the traverse members. The progress of investigations is noted and the results of the activities are given by a description of the traverse area in terms of regional and seasonal aspects, showing the ice sheet topography, direction of prevailing winds, elevations, gravity and geomagnetic values, snow surface conditions, daily variations of weather and some related phenomena.

D-10363
Flint, O.S.
R/V HERO CRUISE 71-2 TO ISLA DE LOS ESTADOS. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.263-265, 3 refs.
Hero Cruise 71-2 surveyed the vertebrate, arthropod, and marine biotas of Isla de los Estados and adjacent areas of Tierra del Fuego, Argentina. A total of 84 stations was sampled, resulting in an accumulation of approx 250 fish, 75 gal of invertebrates, and 55 gal of marine benthic algae. About 480 specimens, representing 54 species of birds and 8 of mammals were collected during the trip. Fifty-one species of birds were recorded from Estados, of which 13 are new records for the island. A total of 322 specimens of 40 species was collected on the island. Approx 8000 insects belonging to 17 orders were collected. Ectoparasites were found on 145 specimens belonging to 35 species of birds and all 4 species of rodents. A collection of intertidal invertebrate fauna yielded examples of 9 phyla contained in 250 lots plus 2 lots of benthic fish. A collection of 5000 arthropods contains 10 orders of insects as well as Arachnida, Symphyla, and Pauropoda.

D-10448
SIR VIVIAN FUCHS RETURNS TO OLD SHACKLETON BASE. Antarctic, June 1971 6(2), p.38-41
British Antarctic Survey activities during 1971 are described, including ship movements, resupply of bases, and the work of field parties. Nearly 14 yr after he and his party set out on

the first crossing of Antarctica, Sir Vivian Fuchs returned for the first time to Shackleton on the R.R.S. Bransfield's maiden voyage to the Antarctic, and found the base in excellent condition. From the Weddell Sea the Bransfield sailed to help the John Biscoe relieve the Antarctic Peninsula bases. Several weeks were spent carrying out biological work in the seas around South Georgia, the South Orkney Is., and Elephant I. Cargo flights to Fossil Bluff and Stonington I. were made by the Otter and the Beaver. Field activities included continuation of the geolcgical survey at Shackleton Range, collection of 200 snow samples inland from Halley Bay, glaciclogical observations and measurement of a survey base line near the Bluff, geological studies by sledge parties from Stonington, biological studies at South Georgia and Signy I., and eruption studies at Deception I.

D-10449
Doorly, G.S.
SOUTH ON THE WINGS OF THE MORNING. Antarctic, June 1971 6(2), p.42-46

Capt. Gerald Doorly made two voyages with his lifelong friend Admiral Lord Mountevans (Evans) to the Antarctic on the Morning relief ship to Capt. Scott's vessel the Discovery, with the National Antarctic Expedition of 1902-04. Portions of Doorly's unpublished autobiography relating to the Antarctic are being printed in this and succeeding issues as a tribute to a great sailor. In this portion of the manuscript, Doorly recalls the invitation from his friend Evans to join him on the Antarctic Relief Expedition, his anxiety on finding himself one of two applicants out of 50, left for selection to the position of Third Officer, the subsequent appointment of both men at Evans' suggestion and Doorly's succession to the position of Third Officer through the toss of a coin, preparations for the journey, and sailing day.

D-10450
WINTER TEAM LAUNCHES FIRST SOUNDING ROCKET. Antarctic, June 1971 6(2). p.47

Members of the winter team of the 12th Japanese Antarctic Research Expedition successfully launched an upper atmosphere sounding rocket from Showa Station at the end of April 1971. The S160 rocket, which has a maximum altitude of about 55 mi, was used to measure the density distributions of electrons and ozone. Six more S210 rockets will be launched this season to measure auroral particles, aurora light, electron and ion densities, electric and magnetic fields, and radio emissions. The icebreaker Fuji returned to Tokyo on May 4, one month behind schedule because of unusually severe weather in the Antarctic.

D-10457
Laws, D.
NEWS FROM CAMPBELL ISLAND. Antarctic, June 1971 6(2), p.67-68

Activities of the New Zealand staff on Campbell I. are reported. On Mar. 10, HMNZS Endeavour arrived carrying supplies and mail. A television film team from Christchurch aboard the vessel recorded the whole day's happenings. During an airdrop by an Orion aircraft, a load broke free of the parachute and was later recovered from Tucker Cove. Maintenance work progressed steadily, a new roof was fitted to the food store, and some safety modifications were carried out on the station and equipment. Several trips were made to the albatross colony on St. Col where the chicks are now being banded.

D-10502
Maksutov, D.D. ed
ELEVENTH SOVIET SUMMER ANTARCIIC EXPEDITION 1965-1966. GENERAL DESCRIPTION AND SCIENTIFIC RESULTS. Jerusalem, Israel Program for Scientific Translations, 1971, 134p., TT 70-50073, English translation of: Odinnadtsataia sezonnaia ekspeditsiia 1965-66g. Obshchee opisanie i nauchnye rezul'taty. Sovet. Antarkticheskaia Eksped., Trudy, No. 50, 1969, 133p. Refs.

An account of the 11th Soviet Antarctic Expedition in the Antarctic in 1965-66 is given. Six papers included in the book are: 1) D.D. Maksutov. Seasonal operations of the 11th Soviet Antarctic Expedition; 2) V.N. Botnikov and S.S. Chikovskii. Oceanographic investigations in the Southern Ocean; 3) V.N. Botnikov. Distribution of sea ice and icebergs in Antarctic waters during the 1965-66 summer period; 4) V.N. Botnikov. New frontal zones in the Southern zones in the Southern Ocean; 5) E.N. Gruzov, M.V. Propp and A.F. Pushkin. Marine biological investigations; and 6) E.N. Kamenev. Geological structure of eastern Enderby Land. For the Russian originals see D-8713, D-8714, J-8715, F-8716, J-8717, B-8718, and E-8719.

D-10528
Petrov, I.G.
THROUGH THE POLE OF INACCESSIBILITY. Cherez Polius nedostupnosti. Leningrad, Gidrometeoizdat, 1971, 192p., In Russian.

A popular account is given of a transcontinental traverse 3411 km long completed by 17 members of the 12th Soviet Antarctic Expedition on Khar'kovchanka tractor-sleds from Molodezhnaya Station through the Pole of Inaccessibility to Novolazarevskaya Station. The train consisted of 3 tractors with sleds and was equipped to conduct scientific observations. The party left Molodezhnaya Station on Dec. 18, 1966, and reached the Pole of Accessibility on Feb. 22, 1967. The route included a stop at Plateau Station on March 3, which emphasized the value of international cooperation. On March 26, 1967 the party arrived at Novolazarevskaya Station. The stations visited by the party, maintenance of vehicles and equipment, and difficulities encountered during the traverse are described. The entire scientific program was completed including seismology, radar soundings, geodesy, gravimetry, meteorology, glaciology, atmospheric physics, and radio communication. A medical check-up of the personnel was scheduled each week to further understanding of the acclimatization and behavior of man in Antarctica.

D-10557
Belov, M.I.
150TH ANNIVERSARY OF THE DISCOVERY OF ANTARCTICA. K 150-letiiu so dnia otkrytiia Antarktidy. Chelovek i stikhiia, 1969, p.47-48, In Russian.
QC851.C39

Activities of the Russian Antarctic Expedition in 1819-21, lead by Bellingshausen and Lazarev and sponsored by Alexander I and the Russian Navy, are briefly described. During the circumnavigation the expedition made various observations and discovered several islands, including Peter I and Alexander I Is. The expedition collected enough data to confirm Antarctica a continent covered with an ice cap and surrounded by sea ice.

D-10563
Ostrekin, M.E. ed , Petrov, I.G. ed
TENTH SOVIET ANTARCTIC EXPEDITION 1965-1966. GENERAL DESCRIPTION AND SCIENTIFIC RESULTS. Jerusalem, Israel Program for Scientific Translations, 1971, 459p., English translation of: Desiataia sovetskaia antarkticheskaia ekspeditsiia. Obshchee opisanie i nauchnye rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia. Trudy, No.49, 474p., 1969.

Accounts of the 10th Soviet Antarctic Expedition at Mirnyy, Vostok, Novolazarevskaya, and Molodezhnaya Stations and of the Ob' and Estoniya voyages during 1964-65 are presented. The work program consisted of geophysical, aerometeorological, glaciological, oceanographic, biological, and medical studies. Research operations aided by ship, aircraft, and tractors for field support were carried out, and measurements were made with latest-type instruments. New sites for fuel storage at Mirnyy and Molodezhnaya were constructed and logistic support provided for the 1965-66 season. For abstracts of the Russian original see: A-8283, 8285, 8289, 8290, 8293; B-8278, 8292; D-8269; F-8271, 8275, 8280, 8281, 8291; G-8284; H-8276, 8277, 8286, 8287, 8288; I-8270, 8279; and J-8272, 8273, 8274, 8282.

D-10620
NAVY'S LOGISTIC SUPPORT FOR DEEP FREEZE 72. Antarctic, Sept. 1971 6(3), p. 83
G845.A55

The U.S. Navy Antarctic Support Force this summer will include 2000 men, 4 Hercules aircraft, 3 Coast Guard ice-breakers, the cargo ships John R. Towle and Wyandot and the tanker Maumee. The latter will deliver about 6 million gallons of fuel to McMurdo Station. Planned activities include air transport of passengers and cargo from the U.S. to Christchurch and McMurdo Station, completion of the site of the new Siple Station in Ellsworth Land and continued work on the new Amundsen-Scott South Pole Station which is scheduled for occupation in late 1974 or early 1975, closing of Byrd Station which will later become a refueling point on the air route from Williams Field to Siple Station, improvements to the living facilities, roads, fuel lines, and other structures at Williams Field and installation of a new sewage treatment plant and incinerator; and shipment of approx 15,000 tons of dry cargo to Antarctica.

D-10622
BRITISH EXPEDITION TO ELEPHANT ISLAND. Antarctic, Sept. 1971 6(3), p. 87-90
G845.A55

Members of a British expedition landed on Cape Valentine, Elephant I., in Feb. 1971 for the first time since Shackleton's men reached the island in 1916 after the Endurance had been trapped and crushed in the ice of the Weddell Sea. The 1970-71 Joint Services Expedition, comprised of 14 men from the Navy, Army, Air Force, and the British Antarctic Survey spent 4 mo surveying the Elephant I. group, determining the movement of the main discharge glacier, studying the extent and topography of the island's glaciers, collecting rocks, terrestrial plants, and soil samples, making a census of the birds and seals of the islands, and climbing mountains. Details of the landing on Cape Valentine and a visit to historic Point Wild are narrated.

D-10623
WINTER PARTY OF 105 MEN AT BASES THIS SEASON. Antarctic, Sept. 1971 6(3), p. 90-91
G845.A55

The British Antarctic Survey will have a winter party of 105 men this season at its 6 main bases and the advance base, Fossil Bluff. Sixty men will go south next month in the R.R.S. John Biscoe and Bransfield, and the twin-engined Otter and the single-engined Beaver will be flown from Canada at the end of the month. Routine observations and maintenance have occupied the men wintering at the bases. An inland depot laying and dog training trip was carried out from Adelaide I., and 9 stakes were placed at 8-mi intervals between the base and the mountains to the north to measure snow accumulation. Activities included geophysical work in Marguerite Bay, survey and glaciological work at Stonington I. and on the Antarctic Peninsula, investigation of ice shelf movement in George VI Sound, penguin observations at Halley Bay, and the continuation of terrestrial programs and Weddell sea observatories at Signy I. Various scientific programs are in progress at South Georgia. Travel in many areas was hampered by strong winds which broke up the sea ice.

D-10624
JAPAN'S ANTARCTIC PLANS FOR THE COMING YEAR. Antarctic, Sept. 1971 6(3), p. 94-95
G845.A55

A full scientific program at Showa Station and a study of marine biology by the expedition ship Fuji are among the plans for the 13th Japanese Antarctic Research Expedition. The program at Showa Station will include studies in ionospheric research, meteorology, seismology, geology, glaciology, and continuous studies of cosmic rays, aurorae and airglow with rocket flights for auroral observations. The Fuji will carry out a program of upper atmospheric physics, marine meteorology, and a survey of sea-water gravities between Tokyo and Showa Station. Marine biology will include measurement of the chlorophyll content of surface sea water and an ecological study of plankton.

D-10625
JARE 12 JOURNEY TO MIZUHO. Antarctic, Sept. 1971 6(3), p. 95
G845.A55

A glaciological party will leave Showa Station for Mizuho, the advance camp about 300 km to the southeast, which was established on July 21, 1970. The party will remain in the field until Jan. A traverse party of 9 men returned to Showa on July 26, 1971 after two weeks at Mizuho where they completed mid-winter supply and construction work. The party erected a small prefabricated hut and dug a trench for installing generator and glaciological equipment.

D-10627
SOVIET EXPEDITION WILL SET UP NEW STATION. Antarctic, Sept. 1971 6(3), p. 97
G845.A55

The seventh Russian research station will be established by this season's Soviet expedition to the Antarctic. The new station will probably be located at Cape Dart on the coast of Marie Byrd Land. The establishment of Leningradskaya, on the Oates Coast, about 200 mi from Hallett Station, was announced last season. The expedition will explore and map the area of the

Amery Ice Shelf between the Lars Christensen and Ingrid Christensen Coasts. For the first time, the expedition will use two large turbine-powered MI-8 halicopters. Soviet scientists at Bellingshausen station on King George I. recently reported the discovery of a new penguin colony about 10,000 strong.

D-10628
Doorly, G.S.
SOUTH ON THE WINGS OF THE MORNING. Antarctic, Sept. 1971 6(3), p. 98-102
G845.A55

The first part of Capt. Doorly's autobiography (D-10449) described his succession to the position of third officer on the Morning, relief ship to Capt. Scott's vessel the Discovery with the National Antarctic Expedition of 1902-1904. This part gives an account of the voyage of the Morning to the Antarctic in search of the Discovery which had sailed from London one year earlier. The author describes life aboard ship, the problems created by the wind and sea ice, a stop at Lyttelton, N.Z., the sea mammals and penguins encountered during the journey, the beauty of the icebergs, and the discovery of an island, which was named Scott I. The Morning finally encountered the Discovery in McMurdo Sound, frozen in her winter harbor at the foot of Mount Erebus. The men of the Discovery were particularly happy to receive their mail. A week after the arrival of the Morning Capt. Scott, Lt. Shackleton, and Dr. Wilson returned from their pioneer southern sledge journey over the Great Ice Barrer. Capt. Scott had named the southern point of the winter harbor Cape Armitage, now marked by a huge wood cross in memory of Capt. Scott and his companions who perished while returning from the South Pole 10 yr later.

D-10629
Laws, D.
LIFE ON CAMPBELL ISLAND. Antarctic, Sept. 1971 6(3), p. 103-104
G845.A55

The activities of the wintering-over party of the 1970-71 New Zealand expedition to Campbell I. are reported. Events of the season included ham radio contact with many countries throughout the world, a second air drop by R.N.Z.A.F. Orion with almost pinpoint accuracy, construction of a hut at North West Bay, a mid-winter celebration on June 21-22 which included a mid-winter swim, and a radio broadcast from Invercargill, especially for Campbell I. Recreational activities included tramping, bird banding, photography, and chess. The main task of the work and maintenance program was the complete re-laying of the Marsden matting road. Total rainfall and temperature for the period were slightly above average, but sunshine was less than normal. Having spent 10 mo of a year's tour of duty on the island, the 1970-71 expedition will soon be replaced by the 1971-72 expedition. The Endeavour, which made three visits to the island this year, is no longer under the Royal New Zealand Navy and will make no more calls at Campbell I.

D-10634
Burley, M.
JOINT SERVICES EXPEDITION TO ELEPHANT ISLAND. Polar record, Sept. 1971 15(99), p.924-925
G575.P6

During Nov. 1970 - March 1971, the Joint Services Expedition to Elephant I. carried out a topographic survey and other field work including geology, geomorphology, glaciology, botany, and zoology. A closed traverse tied-in the island group and control was brought in from King George I. Major landform systems were identified, the extent and occurrence of glaciers was noted, and geological specimens, the first to be collected, were given to the British Antarctic Survey for analysis. More than 50 species of terrestrial plants were identified and a moss bed reaching the unexpected depth of 3 m was examined. A census of birds and seals was carried out and collections of terrestrial and marine invertebrates were made.

D-10638
Matthews, S.W. , Curtsinger, W.R.
ANTARCTICA'S NEARER SIDE. National geographic magazine, Nov. 1971 140(5), p. 622-655

An account is given of the journey across Drake Passage on the Alpha Helix and along the coastline of the Antarctic Peninsula on the Hero. Studies carried out by scientists of geography, geology, climate, marine and terrestrial fauna and flora on and around the peninsula, including Deception I., are reported. Observed was the international cooperation of nations working together under international exchange programs.

D-10646
Baker, P.E. , McReath, I.
INVESTIGATION OF THE 1970 VOLCANIC ACTIVITY AT DECEPTION ISLAND, SOUTH SHETLAND ISLANDS. Polar record, Jan. 1972 16(100), p.67-71, 4 refs.
G575.P6

An international party of geologists and glaciologists assembled on Deception I. during the 1970-71 season to study the 1970 eruptions on the island and its effects. The eruption may have been tapping separate isolated batches of magma around the caldera fault zone rather than drawing from one single magma chamber. Probably the recent events represent continuing adjustment following the caldera collapse. Further outbreaks of activity are highly probable, could affect any part of the caldera fault and need not necessarily recur at the sites of the last 3 eruptions. In chemical composition the 1970 scorious bombs range between those of the products of the 1967 island and of the 1967 land center and are largely distinct from the more basic products of the 1969 eruptions. Pyroclastic volcanic ash was distributed past Nelson I.

D-10726
Winsnes, T.S.
NORWEGIAN ANTARCTIC EXPEDITION 1970-71. Oslo. Norsk polarinstitutt. Årbok, 1970 (Publ. 1972), P. 224-226
G575.078

The activities of the 1970-71 Norwegian Antarctic Expedition to H.U. Sverdrupfjella in Dronning Maud Land are described. The plans of the expedition included detailed geological mapping of the area, biological and glaciological studies, and investigations of the microclimate above the snow surface. In addition, meteorological measurements were carried out and a gravimetric traverse was made. Markers were erected across the 50 km wide Jutulstraumen glacier in order to measure snow accumulation and determine glacier movement. Biological investigations centered on the study and collection of plants and insect material. Rock collections were also made.

D-10753
U.S. Navy Task Force 43
REPORT OF OPERATION DEEP FREEZE 67, 1966-1967. Washington, 1967, 125p.

In 1966-67 the U.S. Antarctic Research Program was logistically supported by the U.S. Naval Support Force, Antarctica at six U.S. Antarctic Stations, aboard USCGC's Eastwind, Glacier, Westwind and Staten Island in waters surrounding Antarctica, and at various remote field sites. Operation Deep Freeze forces also provided air transport for the New Zealand Department of Scienfific and Industrial Research (DSIR) Antarctic Program. This assistance included approximately 12 hours LC-130F flight time and 120 hours helicopter flight time in addition to cargo/passengers carried on flights scheduled for support of U.S. activities. The scientific programs are listed by Operation Order Scientific Event Number arranged by discipline with the exception of U.S. winter-over programs and exchange programs which are listed separately. The specific type support rendered is indicated. Base maintenance and support (berthing, messing, transportation, etc.) are provided for all scientific personnel. Photomapping and construction in support of the science programs are listed in detail.

D-10754
U.S. Navy Task Force 43
REPORT OF OPERATION DEEP FREEZE 68, 1967-1968. Washington, 1968, 63p.

This annual report of the logistical support given by the U.S. Naval Support Force, Antarctica in carrying out U.S. Antarctic research programs describes Operation Deep Freeze 68 and includes sections on the following: (1) Forces employed: (2) Science programs; (3) Ship and air operations, meteorological and oceanographic environmental data, and ground and aerial photography; (4) Improvement of facilities and equipment and vehicles used; (5) Logistics dealing with supply, comptroller-ship, cargo, and fuel; (6) Administration; (7) Communications and electronics; (8) Public affairs; and (9) Medical and dental services.

D-10755
U.S. Navy Task Force 43
REPORT OF OPERATION DEEP FREEZE 69, 1968-1969. Washington, 1969, 52p.

Logistic support of the U.S. Antarctic Research Program and resupply of U.S. antarctic stations was accomplished during Operation Deep Freeze 69 with the participation of U.S. military services, the U.S. Coast Guard and the Royal N.Z. Navy and Air Force units. The activities and programs are reported in CTF-43 Report which includes some of the major achievements and highlights: Deep Freeze 69 marked the third accident free year of air operations, heavy fast ice in McMurdo Sound caused delays in ship operations, and the Southwind was diverted from a projected trip to assist the Thala Dan on a resupply mission. A MAC C-141 airlifted 110 live birds and animals from McMurdo Station to various cities in the U.S. An American flight crew covered 3625 miles in delivering Norwegian and British field parties to most remote camps in Antarctica. Plateau Station was closed at season's end. The last Deep Freeze LC-47 Dakota aircraft was presented to the City of Christchurch for the Ferrymeade Museum.

D-10760
U.S. Navy Task Force 43
TASK FORCE FORTY-THREE OPERATION ORDER NO 1-68, OPERATION DEEP FREEZE 69. Washington, 1968, 231p.

Operation Order CTF-43 No. 1-68 for Deep Freeze 69 cites the Time Zone, Task Organization, and Participating Agency Representatives; Situation in respect to the Antarctic Treaty and the U.S. Antarctic Research Program; Mission and Execution of Task Force 43; Administration and Logistics; Command Designations; and Communications Procedures. Annexes to the order cover the Science Programs, Administration, Operations, Logistics, Communications, Construction and Maintenance, Public Affairs, and Medical and Dental Services.

D-10761
U.S. Navy Task Force 43
TASK FORCE FORTY-THREE OPERATION ORDER NO.1-69, OPERATION DEEP FREEZE 70. Washington, 1969, 195p.

Operation Order CTF-43 No. 1-69, a directive from the U.S. Naval Support Force, Antarctica defines the action to be taken by Task Force 43 in providing facilities, materials, and services to support U.S. scientific investigations in the Antarctic under Deep Freeze 70. Annexes to the order give in detail: (1) Operations -- Schedule of events; ship and air operations; meteorological, oceanographic, and photographic missions. (2) Scientific Programs -- Summaries and field requirements. (3) Logistics -- Storage capacities and cargo schedules. (4) Communications -- Frequency plan and call signals. (5) Construction and Maintenance. (6) Administration -- Personnel; legal and disciplinary measures; postal procedures; reports. (7) Public Affairs -- Release of information and end of season report. (8) Medical and Dental Services -- Statistical report and sick call record.

D-10788
Garey, W.F. , Benson, A.A.
R/V ALPHA HELIX RESEARCH PROGRAM 1971. California, University, Scripps Institution of Oceanography, 44p., 183 refs.

Scientific contributions resulting from the research studies carried out in 1971 at Antarctica, Eniwetok Atoll and on five cruises in the Eastern Pacific aboard the R/V Alpha Helix are discussed. The Antarctic expedition (Jan. 2-Feb. 23, 1971) conducted studies in the Peninsula area on three main subjects: (1) the respiratory and cardiovascular physiology of icefishes; (2) the thermoregulatory physiology of penguins and other birds; and (3) the diving physiology of penguins and cormorants. Specific investigations are described in 20 abstracted field reports. The use of Arthur Harbor, Anvers I. as a base area offered many logistic and scientific advantages, and promoted extensive and valuable cooperation between the R/V Alpha Helix Program and the U.S. Antarctic Research Program at Palmer Station, as well as between scientists and personnel from various countries engaged in research. Information on the facilities of Alpha Helix, the equipment inventory, the procedure for making application for its use, and the attending scientific responsibility is included in this report.

D-10789
Bailey, D.K.
REPORT OF THE UNITED STATES EXCHANGE REPRESENTATIVE WITH THE BRITISH ANTARCTIC SURVEY

ON THE RESUPPLY OPERATIONS IN THE ANTARCTIC DURING THE AUSTRAL SUMMER 1967-1968. Boulder, Colorado, U.S. ESSA Research Laboratory, 1969, 177p.

The U.S. Exchange Representative, D.K. Bailey accounts for his travels in the form of a daily diary. The itinerary is that of the Perla Dan, from Port Stanley to the Falkland Is., South Georgia, and Halley Bay, transfer to the Briscoe to visit Deception I., Signy I., Argentine Is., Adelaide I. and Stonington I., and transfer to the Shackleton for return to Punta Arenas. Notes and observations of the flora and fauna and ecology of the various points of visitation are made in the daily entries and in appendices. Daily routines, social amenities, protocol, and British/Argentine relations over possession of the Falkland Is. are included and further discussed in appendices.

D-10796
Gordon, A.L.
USNS ELTANIN CRUISE 50: PHYSICAL OCEANOGRAPHY IN THE SOUTHEASTERN INDIAN OCEAN. Antarctic journal of the United States, March-April 1972 7(2), p. 38-40, 2 refs.

Physical oceanographic, geophysical, and coring programs were carried out during Eltanin Cruise 50, departing Fremantle, Australia Nov. 8, 1971 and returning to Lyttelton, N.Z. Jan. 4, 1972. Included were north-south sections along 105 E and 170 E, a west-east section along the pack ice boundary from 106 E to 170 E, and four excursions to ice fields off Wilkes Island. Results from two fields showed a broad, uniform temperature-minimum layer with two distinct haloclines while the other two, observed in a large embayment of ice-free water surrounded by a wall of thick pack ice, showed a shallower and thinner temperature-minimum layer and one distinct halocline. A temperature-minimum layer saltier than usual in late summer and increased surface silicates (within 100 km of the ice edge) were observed in all four ice fields. Data collected along and between 105 E and 170 E form the basis of a general oceanographic description of the south-east Indian Ocean, including the Australasian Subantarctic Front, the Polar Front, the Antarctic Circumpolar Current constriction by the Campbell Plateau and the midocean ridge, Ross Sea Antarctic Bottom Water, and a 55 S frontal zone. The sampling procedures and equipment used and some quantitative results are given.

D-10797
Lena, H. , Souto, S.
BIOLOGICAL SAMPLING IN THE ARGENTINE BASIN: R/V HERO CRUISE 71-4. Antarctic journal of the United States, March-April 1972 7(2), p. 41

Samples of plankton, bottom life, fishes, and bacteria were collected between Punta Arenas, Chile and Buenos Aires, Argentina during Aug. 3-Aug. 29. Plankton samples, 560 from 302 stations, of which foraminifera especially, are intended for the completion of an investigation to indicate surface hydrology of the southwestern Atlantic Ocean; the other samples will be used to continue study of benthic communities on the Argentine continental shelf, to evaluate scientific and economic aspects of fishes of the Argentine Basin, and to classify the Argentine Basin bacteria.

D-10798
Imshaug, H.A.
R/V HERO CRUISE 71-5 TO ISLA DE LOS ESTADOS. Antarctic journal of the United States, March-April 1972 7(2), p. 42-44, 2 refs.

Collections from 20 landing sites were made of terrestrial plant life at Isla Grande and on the north and south coasts of Isla de los Estados along the east-west axis between Oct. 13 and Nov. 13, 1971, to add to information on the morphology, taxonomy, and ecological requirements of little known, critical species. Over 9500 samples of lichens, bryophytes, and vascular plants were obtained. Lichen species presumed to have southern limits north of the strait of Magellan were found growing probably because of the greater amount of sunshine in the islands than in the intermediate channel district. Bottom grabs entailing a grid sampling technique were made to study Ostracoda. Breeding colonies of Eudyptes crestatus, Spheniscus magellanicus and Marconectes giganteus were observed.

D-10806
AUSTRALIAN SURVEY INCLUDES PRINCE CHARLES MOUNTAINS. Antarctic, Dec. 1971 6(4), p.116
G845.A55

Extension of a geodetic control survey in the southernmost region of the Prince Charles Mountains with air support by three helicopters and one fixed-wing aircraft is included in the 1971-72 summer exploration program of the Australian National Antarctic Research Expedition. Base camps for the geodetic control survey will be established at Moore Pyramid and Mount Cresswell (360 mi south of Mawson). The work will also include the establishment of markers at selected locations for investigations by glaciologists covering barometric levels, snow sampling, and gravity measurements. Long-term programs in upper atmosphere physics, cosmic ray studies, meteorology, seismology, geomagnetism, and medical science will be continued. In addition special programs in geology, glaciology, and biology are planned. Cosmic ray astronomy equipment will be installed in a new underground laboratory and vault at Mawson Station. The programs for Mawson, Davis, Casey, and Macquarie I., and relief schedules for the Nella Dan and Thala Dan are briefly summarized.

D-10809
SNOWMOBILE JOURNEY TO THE SOUTH POLE. Antarctic, Dec. 1971 6(4), p.120
G845.A55

Walter Pederson, an American engineer, and member of the snowmobile expedition which reached the North Pole on Apr. 19, 1968, has been granted permission to make a snowmobile journey to the South Pole from McMurdo Station. The Antarctic Policy Group, which twice declined applications to make the journey, has approved plans, but imposed certain conditions. Plans call for flying equipment from Christchurch in a chartered Hercules and using a ski-equipped Beaver for support work; permission has also been requested to fly to McMurdo Station by way of South America, using a chartered ski-equipped Twin Otter aircraft. The limited range of the aircraft would require landing at Adelaide I. and Byrd Station. Any assistance given by military aircraft will be charged for at commercial rates and the expedition and its equipment can be returned form the South Pole to McMurdo Station by American aircraft on a space available basis. The support force commander can call off the expedition at any time if conditions are unsafe.

D-10811
BRITISH ANTARCTIC SURVEY NEWS. Antarctic, Dec. 1971 6(4), p.122-124

G845.A55

Lack of sea-ice on the western side of the Antarctic Peninsula, coupled with strong winds and low temperatures hindered the work of survey parties during the season. Much of August was spent in preparing for overland travel by establishing an 8-ton depot 500 ft up on the plateau above Stonington I. which was completed in time for several sledge parties to set off for the south at the beginning of September. Activities included survey and glaciological work on the Wordie Ice Shelf, establishment of the eastern and western ends of a survey line to be measured across George VI Sound, and re-survey of the glaciological scheme at the southern end of the Sound. An important fossil discovery was made in a 150 ft exposure of argillites and shales south of Carse Point. The fossils included ammonite casts, wood fragments, bivalves, and belemnites, and appeared to be of Cretaceous age. The establishment of a new inland route made it possible to establish a field station at 78 deg 20 min S, 17 deg 30 min W where a week's whistler recordings were made. More than half of the recordings were synchronized with those at Halley Bay and SANAE Station. The Bransfield and John Biscoe sailed from Southampton in Oct. carrying 1000 tons of stores and 71 men for the bases.

D-10812
JAPANESE RESEARCH ACTIVITIES. Antarctic, Dec. 1971 6(4), p.125

G845.A55

Members of the winter team of the 12th Japanese Antarctic Research Expedition completed the series of rocket observations of the aurora at Showa Station with the launching of an S210 sounding rocket on Dec. 1. Two S210 rockets launched on Sept. 14 and 25 reached heights of 70 and 85 mi, respectively, carrying out observations of physical parameters in the aurora successfully. Several spring parties have traveled to Mizuho, the inland station about 185 mi southeast of Showa. Activities include a deep drilling test and related glaciological and meteorological work. The Japanese Government plans to invite observers from Argentina, New Zealand, Norway and South Africa to join the summer program in 1972-73.

D-10813
FIRST STAGE OF FRENCH TRAVERSE DELAYED. Antarctic, Dec. 1971 6(4), p.126-127

G845.A55

The first stage of the French traverse from Carrefour across Wilkes Land towards the Soviet Vostok Station has been delayed due to bad weather, rough terrain, and several days spent rendering assistance to the passengers of a damaged Hercules aircraft following completion of its supply mission. This traverse, which is part of the International Antarctic Glaciological Project, is expected to be completed during the summer of 1972-73. The scientific program includes geodetic, glaciological and gravimetric investigations. Ice flow measurements will be made and ice core samples from depths up to 165 ft will be analyzed to obtain data on glacial periods, atmospheric evolution, etc. Planned activities at Dumont d'Urville this season include construction of several buildings and a platform for launching weather sounding balloons, installation of a 12,500-gal fuel tank, survey of the Astrolabe Glacier from an Alouette helicopter, experiments with a thermal ice coring drill to a depth of 1650 ft, penguin and petrel studies, meteorological observations, and ionosphere studies. Medical and environmental research will also be conducted.

D-10814
SOVIET TRAVERSE TO VOSTOK. Antarctic, Dec. 1971 6(4), p.128

G845.A55

Between Mirnyy and Vostok, and on the return journey, the 17th Soviet Antarctic Expedition will make snow-measuring observations and set up new automatic stations for the continuous recording of magnetic variations. Observations planned for a traverse from Mirnyy to Vostok include geodesy, glaciology, seismic sounding, radio location, gravimetry, terrestrial magnetism, and meteorology. In addition to transport activities the Ob and the Professor Vize will be used for marine studies and oceanographic work. The seventh Soviet station is expected to be established at Cape Dart on the coast of Marie Byrd Land. The Soviet expedition will continue investigations of the following: climate, Southern Ocean waters, glacier cover, ice cover of Antarctic seas, geological structure and minerals, ionosphere physics and radio-wave propagation, geomagnetic field variations, electromagnetic field variations, geodetic control, and acclimatization. Eight aircraft, two helicopters, and twelve tractors will aid supply operations.

D-10816
EXPEDITIONS SUPPORTED BY YELCHO AND PILOTO PARDO. Antarctic, Dec. 1971 6(4), p.130-131

G845.A55

Since 1947 Chile has sent 25 expeditions to the Antarctic. The main logistic support fot the 25th Chilean Antarctic Expedition was provided by the Piloto Pardo and the Yelcho, two ships of the Chilean Navy. The program of the 25th expedition included studies of benthic communities, the stomach contents of fish caught in Fildes Bay, King George I., soil biology, ornithology, taxidermy, and Jurassic and Cretaceous stratigraphy and paleontology in the South Shetland Is. A helicopter from the Piloto Pardo provided logistic support for a survey of the west coast of the Antarctic Peninsula to define the most adequate area to start an intense glaciological program. The Yelcho provided logistic support for oceanographic work carried on at 51 oceanographic stations. The Yelcho and the Piloto Pardo's helicopter also supported geological studies carried out at Deception I. on new craters associated with the eruptions in Aug. of last year, structural changes produced in this island by the eruptions, and chemical and petrographic analyses of ejected material.

D-10817
Doorly, G.S.
SOUTH ON THE WINGS OF THE MORNING. Antarctic, Dec. 1971 6(4), p.132-136

G845.A55

Previous reminiscences (D-10628) relate the sailing to McMurdo Sound of the relief ship Morning and finding Capt. Scott and party well, but with the Discovery firmly frozen in the ice. This third and concluding article relates the events leading up to the freezing of the Discovery and the subsequent journey home. Since the Discovery was faced with the prospect of imprisonment for a second winter in the Antarctic ice and McMurdo Sound was showing signs of freezing over, the Morning sailed on Mar. 2, 1903 for New Zealand, accompanied by Lt. Shackleton who was not well enough to remain for

another winter. After wintering in New Zealand and proceeding to Hobart, the Morning was joined by another relief ship, the Terra Nova, and loaded with stores and 16-lb cylinders of gun cotton the two ships sailed in early Dec. 1903 for the south with the hope of blasting the Discovery from the ice. Arriving in McMurdo Sound a month later the Morning encountered a solid sheet of ice extending for 18 mi to Hut Point. After much blasting and six weeks of work by the men from the three ships the Discovery was freed and readied for the return trip north. Following a squall which caused considerable damage to the Discovery, the three ships got under way, reaching Lyttelton Harbor, after a short stay at Port Ross, Auckland Is., on Apr. 1, 1904.

D-10840
Maksutov, D.D.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.556-562. Translated from its Informatsionnyi biulleten' No.77, 1970.
Q115.S6862
The investigations carried out by the 14th Soviet Antarctic Expedition at Mirnyy, Vostok, Molodezhnaya, Novolazarevskaya, and Bellingshausen Stations from July to Dec. 1969 are summarized. Data on the mean atmospheric pressure, air temperature, wind velocity, relative humudity, cloudiness, and mean height of radiosonde ascents are tabulated. The results of aerometeorclogical, geophysical, glaciological, hydrological, glacio-geographical, medical, and biological observations at the stations and in adjacent waters are reported. Included is a note on thermal drilling operations to 250 m at Mirnyy Station from Oct. to Nov. 1969.

D-10841
Shamont'ev, V.A.
WINTERING OPERATIONS OF THE THIRTEENTH SOVIET ANTARCTIC EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.567-570, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862
Activities of th 13th Soviet Antarctic Expedition (169 members and 5 foreign scientists) at Mirnyy, Molodezhnaya, Vostok, Novolazarevskaya, and Bellingshausen Stations, during overland traverses, and voyages of the Ob', Professor Vize, and Professor Zubov in the Southern Ocean from Dec. 1967 to March 1969 are reviewed. Research programs carried out in the Antarctic include studies in aerology, geophysics, oceanography, geodesy, glaciology, physiography, logistics, and medicine. New astronomical-geodetic stations for photographic satellite observations were established at Mirnyy, Vostok, and Molodezhnaya, and a new auroral radar set was put into operation after a 3-yr interruption. In addition to scientific observations, the expedition completed extensive engineering operations and construction work.

D-10859
Skiauteris, I.R.I. , Shamont'ev, V.A.
INTERNATIONAL CONTACTS OF THE THIRTEENTH SOVIET ANTARCTIC EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.617-619, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862
The activities of the 13th Soviet Antarctic Expedition in international cooperation and compliance with the Antarctic Treaty, especially with Australia, Argentina, the U.S., Chile, and Japan are briefly noted and cover radio communication, correspondence, exchange of scientists, reciprocal visits by ships, mutual assistance in station building, and tourism. The Antarctic stations operating in 1968 and directions of radio communication links between the 13th S.A.E. and foreign stations are shown and discussed.

D-10861
Gerbovich, V.I.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.621-623, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862
A brief report is given of aerometeorological, geophysical, glaciological, hydrological, and biological investigations conducted by the 15th Soviet Antarctic Expedition in Jan. and Feb. 1970 at Mirnyy, Vostok, Molodezhnaya, Novolazarevskaya, and Bellingshausen Stations. Included are summaries of ice drilling operations at Vostok Station and of seasonal investigations on board the Ob' of ice distribution, water temperature, hydrologic surface samples, marine mammals, and depth soundings. A 500-km long stretch of the Oats Coast was surveyed visually from aircraft to select a site for the new Leningradskaya Station.

D-10908
Maksutov, D.D.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.429-432, Translated from its Informatsionnyi biulleten' No.75, 1969.
Q115.S6862
An account of the 14th Soviet Antarctic Expedition at Mirnyy, Vostok, Molodezhnaya, Novolazarevskaya, and Bellingshausen Stations in Jan. and Feb. 1969 is given. The results of aerometeorological, geophysical, glaciological, hydrological, and medical observations at the stations are reported. The seasonal work included ice thickness measurements on the Molodezhnaya-174th km mark profile and radio soundings of the coast of Pobeda I. and of the Polar Record Ice Shelf.

D-10922
Maksutov, D.D.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.471-476, Translated from its Informatsionnyi biulleten' No.76, 1969.
Q115.S6862
The studies conducted in the Antarctic by the 14th Soviet Antarctic Expedition from March to June 1969 are reported. General results of seasonal investigations and aerometeorological, geophysical, glaciological, hydrological, medical, and biological investigations at Mirnyy, Vostok, Molodezhnaya, and Bellingshausen Stations and in adjacent waters are summarized.

D-10924
Shpaikher, A.O. , Alimova, T.A.
THREE LEGS OF THE AMERICAN TRANSANTARCTIC

EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.478-482. Translated from its Informatsionnyi biulleten' No.76, 1969. 9 refs.
Q115.S6862

Activities and program are described of the American Transantarctic Expedition, which was organized by the National Science Foundation in 1964 to cross Queen Maud Land in zigzag-fashion from the South Pole to Roi Baudouin Station on three Sno-Cats. The first part of the traverse began on Dec. 4, 1964 from Amundsen-Scott Station to the Pole of Inaccessibility. The second part started on Nov. 22, 1965 from the Pole of Inaccessibility to Plateau Station. The last part of the traverse began on Dec. 6, 1967 from Plateau Station and ended 320 km NE of the Shackleton Range, having covered 1312 km during the 1967/1968 summer period. The expedition personnel were sent to McMurdo Station on Jan. 29, 1968.

D-10990
McWhinnie, M.A.
USNS ELTANIN CRUISE 51: BIOLOGICAL STUDY OF THE ROSS SEA. Antarctic journal of the United States, May-June 1972 7(3), p.59-61, 5 refs.
G845.A56

During Eltanin Cruise 51 leaving Lyttleton, N.Z. Jan. 17, 1972 and arriving at McMurdo Station Feb. 25, 1972, biological sampling, analysis, and experiments were carried out to determine functional relationships and energy flow in the trophic hierarchy of the antarctic marine ecosystem. Operations by trawling and at 18 multiple-operation stations, included a track near Campbell Island, the Balleny Islands, and in the Ross Sea between Cape Adare and Cape Colbeck, and along the Ross Ice Shelf between the Bay of Whales and McMurdo Sound. Krill distribution described by Marr (1962) and seen farther north on Cruise 50 was extended to the east end of the Ross Sea by present observations. Swarming of decapod larvae was suggested by variations in quantity of collected samples. Benthic environmental changes were evident from samples taken near Cape Colbeck and the Bay of Whales. An uncharted contour in the ice shelf lying east of the Bay of Whales and extending approximately 8 miles eastward was charted and previous camp sites were observed. Research programs, preliminary findings, and operations on board the Eltanin are briefly described.

D-10991
Guthridge, G.G. ed
LATE-SEASON FIELD ACTIVITIES (FEBRUARY-MARCH 1972). Antarctic journal of the United States, May-June 1972 7(3), p.62-65
G845.A56

The U.S. antarctic program moved from extensive summer activity to winter-over routine, the station population declining 990 on February 1 to the winter-over figure of 204 on March 31. The summer's high, in December, had been 1,150. At the South Pole, low temperature and high wind halted work on the new station. At McMurdo Station, a March storm carried away nearly all of the new steel protective facing at Elliott Quay, completed only weeks before after 3 years of work. Near Showa Station, pack ice gripped the Japanese icebreaker Fuji for a month but set her free before U.S. icebreakers could arrive to help. Programs and support activities were carried out successfully at McMurdo, Amundsen-Scott South Pole, Novolazarevskaya, Siple, and Palmer Stations. Eighty-five percent of planned construction was completed, the new South Pole Station elements providing for most of the uncompleted work. Air operations were assigned two high priority tasks, to move as much construction as possible to South Pole and to redeploy to New Zealand the summer Navymen and investigators. Ross Sea ship operations included activities of the Wyandot, Maumee, Staten Island, and Northwind. The Southwind continued a seal population study in the Bellingshausen and Amundsen Seas.

D-11000
PRINCE CHARLES MOUNTAINS PARTY'S WORK COMPLETED. Antarctic, Mar. 1972 6(5), p.154-155
G845.A55

The successful completion of the Australian National Antarctic Research Expedition's 1971-1972 summer program in the southern Prince Charles Mountains several hundred miles south of Mawson is reported. The field work included extension of a geodetic control survey, glaciology, biology, and geophysics. Three Hughes 500 helicopters and a Pilatus Turbo-Porter fixed-wing aircraft were used in the program. Heavy pack ice was encountered this season by the Nella Dan on her voyage south with the 1972 relief parties for Mawson and Davis stations and the Thala Dan on a relief expedition to Casey. The relief operations and problems created by the pack ice are discussed.

D-11002
OPEN WATER SPEEDS RELIEF OF BASES. Antarctic, Mar. 1972 6(5), p.158-160
G845.A55

British Antarctic survey activities during the summer season included relief of British bases by the Bransfield and the Briscoe, glaciological echo-sounding flights over George VI Sound, flights in support of field parties, geological and survey work, and construction of several new huts. Numerous short trips from Halley Bay were made to measure sea temperature, collect sea-bed samples, map the ice front north of the base, transport personnel, and and carry out physiological studies. A geophysical party spent a month on western Alexander I. and later reconnoitered the area inland from Mobiloil Inlet on the east coast of the peninsula. A survey party succeeded in closing the tellurometer traverse across the Wordie Ice Shelf and George VI Sound. H.M.S. Endurance visited all bases except Halley Bay, assisted field parties at South Georgia, and began a hydrographic survey in the Debenham Is. area of Marguerite Bay. A party of zoologists at Bird I. South Georgia tagged or marked more than 8000 fur seals.

D-11006
SOUTH AFRICAN EXPEDITION LARGEST EVER DISPATCHED. Antarctic, Mar. 1972 6(5), p.170-171
G845.A55

South Africa's 13th Antarctic expedition -- a R250,000 31-man team, the largest ever mounted -- sailed in the research ship RSA for Sanae Station in western Queen Maud Land from Cape Town on Jan. 6. Included in the group were 11 scientists who will carry out weather, topographical, and other surveys, 7 artisans to man a base improvement and maintenance program, and 13 logistic and administrative staff. New quarters were built last year to replace the quarters built in 1961 which are now more than 50 ft under the surface. South Africa's contribution on the western Queen Maud Land region is of international scope, its meteorological data is used by Australian and New

Zealand weather forecasters and seismographic information is regularly transmitted to the U.S. Stores, parcels, mail, and a new team were delivered to Marion I. by the French ship Gallieni.

D-11008
FUJI MEETS TOUGHER ICE ON SYOWA RELIEF TRIP. Antarctic, Mar. 1972 6(5), p.174-175
G845.A55

Last season (1971) Japan's icebreaker Fuji was trapped in pack ice for 39 days after leaving Showa Station. This season she made rather slow progress through fast ice about 6 1/2 ft thick near the station, and the formal change-over of the 12th and 13th Japanese Antarctic Research Expeditions was expected to take place later than the scheduled date of Feb. 20. This season JARE 12 launched six S210 and one S160 upper atmosphere sounding rockets and studies were made of the geology, geomorphology, glaciology, and biology of Hinode Point on the Prince Olav coast. Showa Station was visited by a Russian Ilyushin-12, containing a party of 12, and a Russian helicopter.

D-11092
Swithinbank, C.
UNIVERSITY OF MICHIGAN EXPEDITION TO THE ROSS ICE SHELF 1961-62. Ice, July 1962 No.10, p.5-7
GB2401.122

Activities of a three-man expedition organized by the University of Michigan to the Ross Ice Shelf from Oct. 14, 1961 to March 11, 1962, are reported. The expedition was to continue measurements begun in 1960-1961 of the rate of movement of the principal valley glaciers flowing into the west side of the Ross Ice Shelf. Temperature and gravimetric explorations were also made during traverses of the expedition.

D-11102
Zinderen Bakker, E.M. , Dryer, R.A., Winterbottom, J.M. eds
MARION AND PRINCE EDWARD ISLANDS; REPORT ON THE SOUTH AFRICAN BIOLOGICAL AND GEOLOGICAL EXPEDITION, 1965-1966. Cape Town, Balkema, 1971, 427p., Numerous refs. Expedition sponsored by the Department of Transport of the Republic of South Africa and supervised by the South African Scientific Committee for Antarctic Research
QH199.5.S68

This monograph represents the results of a comprehensive study of the geology and biology of Marion and Prince Edward Is. carried out by the South African Expedition to these islands in 1965-66. Marion and Prince Edward Is. were previously little known to science and the results obtained by the expedition have revealed important information on the origin, age and geological history of these islands, and on their flora and fauna. The material is presented in 37 chapters arranged in 3 parts: 1) General; 2) Biogeography and Systematics - Botany; and 3) Biogeography and Systematics - Zoology. The book contains 25 color plates, 89 black and white photographs, and topographical and geological maps of the islands. For abstracts of papers see 11103-11141.

D-11103
Zinderen Bakker, E.M. van, Sr.
SOUTH AFRICAN BIOLOGICAL AND GEOLOGICAL EXPEDITION. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.ix-xi
QH199.5.S68

The South African Biological and Geological Expedition, administered by the South African Department of Transport, materialized in order to carry out botanical and palaeobotanical research on the islands Marion, Prince Edward, St. Paul, New Amsterdam, and the Crozet Archipelago. During the planning stage it was decided to restrict the investigations to the Marion and Prince Edward Is. Following a short reconnaissance of four days to Marion I. to assess the practical implications of the contemplated expedition a ten-member scientific team was appointed. The wooden Government House on Marion I. was put at the disposal of the expedition to be used as a laboratory, and the research ship Republic of South Africa provided logistic facilities. Three months were spent on field work after which the expedition returned to Cape Town leaving the ornithologist and botanist on Marion I. for a further year of more intensive research. The scientific specialists, institutions, and authorities assisting the expedition are listed.

D-11104
Zinderen Bakker, E.M. van, Sr.
INTRODUCTION. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.1-15, 41 refs.
QH199.5.S68

The introductory chapter of this monograph presents a general and integrated picture of the various aspects of the research carried out by the South African Expedition with suggestions for future research. The topics discussed include: the discovery and exploration of the islands; origin of the islands; climatological and oceanographic setting; origin of the island biota; diversity of the biota; biogeography; the island's ecosystems; mammals and birds; and conservation. Results of the expedition are expected to stimulate further research on the islands and lead to a modern research station on Marion I.

D-11218
Lazarev, G.E.
TRIGONOMETRIC LEVELING ON THE KOMSOMOL'SKYA-SOVETSKAYA-VOSTOK- KOMSOMOL'SKAYA PROFILE. Geophysical bulletin, 1966 No.13, p.54-62, Translated from Geofizicheskii biulleten' No. 13:49-56, 1963. 1 ref.

Coordinates and elevations of the stations established along the traverse are tabulated. Both trigonometric and geometric leveling over a distance more than 1500 km was found to be satisfactory, with a rate of progress of up to 65 km/day. The importance of a tie-in of the traverse to a second coastal control point is emphasized.

D-11418
AUSTRALIANS MEET RUSSIAN SCIENTISTS DURING SURVEY. Antarctic, June 1972 6(6), p.190-193
G845.A55

Another phase of the Australian National Antarctic Research Expedition's survey of the southern Prince Charles Mountains several hundred miles south of Mawson was completed last season. In the course of their work Australian scientists made contact with members of the Soviet Antarctic Expedition working in MacRobertson Land. The Russians visited the Australian base camp at Mount Cresswell, and

also made three calls at Mawson. The Australian survey concentrated on the extension of the previously established geodetic survey and a study of the total mass flow of ice into the Lambert Glacier drainage basin. The geology of the area was examined on a macro-scale as a preliminary to more intensive work in the future, geomagnetic examinations were made, and lichens collected throughout the region. Work on the new cosmic ray facility under construction at Mawson Station is described. A more sophisticated latrine building, using electricity and liquefied petroleum gas was also installed.

D-11419
WINTER PARTY OF 101 WILL WORK AT SEVEN BASES. Antarctic, June 1972 6(6), p.194-195
G845.A55

During 1972-73 there will be a winter party of 101 men at the seven British Antarctic Survey bases -- Argentine Is., Adelaide I., Stonington I., Signey I., South Georgia, Halley Bay, and Fossil Bluff. The activities of the Survey are discussed, including operations by the Bransfield and the Biscoe, support flights by the Twin-Otter and the Turbo-Beaver, and the work of field parties engaged in botanical, zoological, geological, and glaciclogical investigations. Short glaciological journeys were made in the Halley Bay area to level and measure the movement of stakes. The hinge zone marking the boundary between inland ice and the ice shelf was reinvestigated and a new route reconnoitered. An airglow project at the Argentine Is. and programs of simultaneous whistler recordings at Halley Bay and SANAE Station were started to coincide with the passes of the Ariel 4 satellite. Overgrazing of reindeer on South Georgia appears to be threatening the vegetation.

D-11421
WEATHER AND BAD TERRAIN REDUCE FRENCH TRAVERSE. Antarctic, June 1972 6(6), p.197-199
G845.A55

The Wilkes Land traverse towards Vostok Station, part of the International Antarctic Glaciolcgical Project planned by France, the United States, the Soviet Union, and Australia, was the main scientific project in the French program last season. Because of bad weather, the difficult terrain, and the need to repair equipment, the Frech scientific traverse party was unable to complete the journey. Approximately 800 km of the planned 1000 km were covered. The accomplishments and difficulties encountered during the journey are described. A responding beacon was installed on an iceberg at 65 deg 11 min S and 139 deg 44 min E to follow the movements of the iceberg and therefrom learn the direction and strength of the ocean currents. The beacon will be interrogated by the E.O.L.E. satellite which is in polar orbit, and it will reply, indicating its position and transmitting information tc ground receiving stations. Relief of bases during the season was carried out by the Thala Dan.

D-11422
JARE 12 TEAM RETURNS TO TOKYO BY AIR. Antarctic, June 1972 6(6), p.200
G845.A55

After an absence of 17 months, including nearly three weeks locked in the ice aboard the icebreaker Fuji, 30 members of the 12th Japanese Antarctic Research Expedition returned to Tokyo by air on Apr. 29. Caught in fast ice on Mar. 7 for the third time in three successive seasons, after relieving Showa Station, the Fuji finally freed herself at 5.40 a.m. on Mar. 28. She reached Cape Town on Apr. 10 and called at Jakarta before returning to Tokyo. A week before the Fuji broke out of the pack ice two United States Coast Guard icebreakers, the Northwind and the Southwind, sailed to the assistance of the Fuji. At Mizuho, the small inland station about 185 miles southeast of Showa, which was occupied for four months, samples of ice several thousand years old were obtained. Glaciologists bored into the ice-cap to a depth of about 240ft. Data were also collected on the upper atmosphere rocket sounding programm, the magnetic field, and spontaneous radio waves.

D-11443
ARGENTINE POLAR EXPEDITION. Expedición Polar Argentina. Buenos Aires. Instituto Antártico Argentino. Bcletín, May 1966 2(19), p.3-7, In Spanish.

On October 26, 1965 the First Argentine Polar Expedition left General Belgrano Station under the command of Colonel Leal with the primary objective of reaching the Geographic South Pole by land. The expedition had two purposes: scientifc and political. Displacement and magnetic intensity in the Filchner Ice Shelf were measured, and meteorological data was collected. Politically, the expedition was intended to emphasize the importance to Argentina of her territorial rights in Antarctica.

D-11468
Leal, J.E.
OPERATION 90. Operacion 90. Argentine Republic. Direccion Nacional del Antartico. Divulgacion No. 2, Buenos Aires, Instituto Antartico Argentino, 1971, 64p., In Spanish with English, French, German and Italian summaries.

The scientific aspects of the First Argentine Land Expedition to the South Pole (Oct.-Dec. 1965) are described, along with historical background and preparations during the 1962-1964 period. The combined operations of deployment and logistical coordination prior to the expedition and a chronological account of the outstanding events and scientific observations during the trip are described in a general manner. The 66-day trip covered 2900 kilometers.

D-11502
Sovetskaia antarkticheskaia ekspeditsiia, 1955- . Sen'ko, P.K. ed
TWELFTH SOVIET ANTARCTIC EXPEDITION; (SEASONAL INVESTIGATIONS IN 1966-1967); GENERAL ACCOUNT AND SCIENTIFIC RESULTS. Dvenadtsataia Sovetskaia antarkticheskaia ekspeditsiia; (Sezonnye issledovaniia 1966-1967 gg.); Obshchee opisanie i nauchnye rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, 312p., In Russian with English table of contents. Numerous refs.
G860.S63

An account of the 12th Soviet Antarctic Expedition on the continent and in antarctic waters in 1966-1967 is given in two parts: 1) description of the expedition and activities of the Ob' in logistic support of Soviet stations and aircraft; and of establishing contacts with non-Russian expeditions; and 2) scientific results obtained in oceanology, geology, glaciology, geodesy, geophysics and microbiology. For abstracts of reports written by personnel of

the expedition see: B-11509; C-11515, 11517, 11518; D-11503; E-11510; F-11504, 11505, 11511, 11512, 11513, 11516; J-11506, 11507; and K-11514.

D-11503
Sovetskaia antarkticheskaia ekspeditsiia, 1955-
GENERAL DESCRIPTION. Obshchee opisanie.
Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.6-14, In Russian.
G860.S63

Scientific work done by 63 members of the 12th Soviet Antarctic Expedition during 1966-1967 in the antarctic Indian Ocean and on the continent is reviewed. The article includes: 1) general work problems of the expedition: a) cargo operations of the Ob', b) replacement of winter personnel at stations, c) aircraft operations, and d) international cooperation; 2) Scientific work on the mainland: a) inland traverse observations, b) geological and geophysical research, c) radio sounding of glaciers, and d) sledge-tractor traverse along the Mirnyy-Vostok-Mirnyy route; and 3) Scientific observations aboard the Ob': a) oceanographic observations, b) meteorological observations, and c) study of short radio-wave propagation on the Moscow-Ob' path. Appended are data on water analyses for salinity, temperature, oxygen, hydrogen ions, silicon and density from each station. A list of participating personnel and their occupations is given.

D-11522
OPERATION HIGHJUMP II. Washington, D.C., U.S. Naval Support Force, Antarctica, 1970, 33p., 87 refs.

Operation Highjump II, an expedition which was cancelled after the planning stage, is discussed. Planning took place in the late 1940's for the expedition, which was to be the link between Highjump I and the Deep Freeze operations. Bureaucratic procedures during the planning stage and reasons for canceling (mostly economic) are described.

D-11543
Belgian-Netherlands Antarctic Committee
BELGIAN-NETHERLANDS ANTARCTIC EXPEDITION 1966. Expedition Antarctique Belgo-Neerlandaise 1966. Brussels, [1967], 13p., In French.

The program of observations at Roi Baudouin Station during the Antarctic summer of 1965-1966 is described essentially as a continuation of 1965 activities. Geology, gravimetry, and atmospheric electricity were studied with greater emphasis than previously. Scientific observations and the instruments used are outlined.

D-11610
Stewart, H., Jr.
EYEWITNESS PICTURES OF THE CHALLENGER EXPEDITION DISCOVERED. Environmental data service, Oct. 1972, p.3-7, 2 refs.

The discovery of a sketchbook of colored paintings signed by Benjamin Shephard on the H.M.S. Challenger, including the period the Challenger spent in Antarctica, is reported. The sketches, previously unknown, are dated and done by a previously unmentioned individual, the ship cooper. The sketches include one of a storm which is assumed fictitious, a fanciful portrayal of mermaids, several featuring icebergs, and a number showing the Challenger at various ports along the way. It may be assumed from the subject matter and dates that a considerable number of sketches remain to be discovered.

D-11676
Lorius, C. , Vaugelade, J.
800-KM TRAVERSE FROM DUMONT D'URVILLE TOWARD VOSTOK STATION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.154-155
G845.A56

As part of the International Antarctic Galciological Project, a French traverse party conducted glaciological investigations, starting from Carrefour (66 deg 50 min S, 139 deg 18 min E) and ending at 73 deg 04 min S, 128 deg 44 min E. The party covered 1,600 km in 100 days. Scientific work included establishment of permanent markers, barometric leveling, and slope and gravimetric measurements every 10 km. More detailed glaciological work at several stations included astronomical position determinations, deformation networks, atmospheric measurements, setting of accumulation stakes, and snow sampling.

D-11731
Nordhill, C.H.
AIR OPERATIONS DEEP FREEZE 72. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.215-217
G845.A56

Antarctic Development Squadron Six, the flying arm of the U.S. Naval Support Force, Antarctica, completed its 17th consecutive season of logistic support for the United States Antarctic Research Program during Deep Freeze 72. Four (after early December three) LC-130 transports and six new UH-1N Helicopters completed nearly 5,000 flight-hours in deployment to Antarctica, direct support of U.S. and New Zealand research projects, resupply of inland stations, and redeployment to the United States. Also, icebreaker-based U.S. Coast Guard helicopters contributed more than 500 flight-hours. Operations began in late August 1971 with flights from the home base at Quonset Point, Rhode Island, to McMurdo Station. The crash of one of the LC-130's in December (no one was injured) forced curtailment of two large science projects: an airborne radio echo ice sounding project and photo flights for a seal census in the Bellingshausen and Amundsen Seas. A new antarctic parachuting record was set on Jan. 12 when the squadron's para-rescue team jumpmaster jumped from 20,500 ft, freefalling for 90 sec. The previous record jump was from 16,500 ft.

D-11744
Jonason, J.
RACE TO THE SOUTH POLE. Kapplopningen mot Sydpolen. Orienterings serien, 59(37), Stockholm, Bokforlaget Liber, 1969, 75p., In Swedish.

Amundsen's and Scott's expeditions to the South Pole in 1911-1912 are described in a popular manner with photographs showing scenes of the Norwegian expedition's activities and details of Antarctic terrain. Summaries of polar exploration history and general comments on arctic and antarctic research are included.

D-11785
Burley, M.
JOINT SERVICES EXPEDITION TO ELEPHANT ISLAND. Geographical journal, Sept. 1972 238(3), p.298-308, 10 refs.
G7.R91

This paper describes the field work undertaken by the Joint Services Expedition to Elephant Island, during the southern summer of 1970-71. The main task of surveying the group of islands was satisfactorily completed. Additional work covering geological, geomorphological, glaciological, botanical and zoological aspects was pursued and this has led, or is now leading, to the compilation of initial records or the broadening of existing evidence about the area. During the course of the expedition, first ascents of 19 peaks including all the major mountains were undertaken. The two historic camp sites occupied by Sir Ernest Shackleton's Imperial Trans-Antarctic Expedition in 1916 were also revisited.

D-11786
Jones, A.G.E.
VOYAGE OF THE TERRA NOVA. Geographical journal, Sept. 1972 238(3), p.309-315, 23 refs.
G7.R91

The Discovery, Commander R.F. Scott, RN, sailed in 1901 and when the Morning went to her relief in 1902-3 she was found firmly frozen in. The Government took alarm and chartered the Terra Nova under Captain Henry Mackay to supplement the second attempt of the Morning. The Terra Nova was fitted out quickly and made a rapid passage to Hobart. This time the Discovery was freed and returned to New Zealand with the Morning and the Terra Nova. The voyage of the Terra Nova was given a few lines in Scott's Voyage of the Discovery, but the log-book of the Terra Nova and the diary of the first officer, together with other sources, supply a fuller record of this service carried out so efficiently.

D-11801
Shimizu, H.
GLACIOLOGICAL RESEARCH PROGRAM IN MIZUHO PLATEAU-WEST ENDERBY LAND. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.1-11, 25 refs.

The glaciclogical research program on Mizuho Plateau-West Enderby Land is composed of two major projects: 1) Oversnow traverses for glaciclogical, meteorological, geographical and geophysical studies by JARE 10, 11, 14 and 15, and 2) A pilot study of deep cores of the inland ice sheet, by means of drilling and analyses, by JARE 12, 13 and 16. Results are presented of the observations and surveys carried out by JARE 10 and 11 on the oversnow traverse project from 1969-1971. The subjects studied include shape and amount of the ice sheet; physical and chemical properties of the surface snow cover of the ice sheet; mass balance of the ice sheet; meteorological conditions; gravity and geomagnetism; and geographical and geological surveys. The oversnow traverse by JARE 10 covered the west side of 43 E longitude to the Yamato Mountains, and that by JARE 11, the east side of 43 E to the Sandercock Nunataks. Approximately 1500 km were covered on the Mizuho Plateau in 90 days by JARE 10, while JARE 11 covered approximately 1650 km, mainly in West Enderby Land, in 82 days.

D-11880
Ronne, F.
RONNE ANTARCTIC RESEARCH EXPEDITION, 1946-48. Conference on United States Polar Exploration, 1967, Washington, D.C., United States polar exploration, Athens, Ohio, Ohio University Press, 1967, p.159-171
G678.C67 1967

The objectives of the Ronne Antarctic Research Expedition were to delineate the unexplored Weddell Sea coastline and the unknown area S of the coast and perhaps to find the termination of the mountain axis of the Antarctic Peninsula. The activities of the expedition are described, including the areas explored and photographed and the scientific studies carried out. For the entire expedition, a total of 250,000 sq mi of heretofore unexplored terrain and 450,000 sq mi of terrain that had been explored were accurately photographed for the first time and recorded in over 14,000 aerial photographs. Three hundred and forty-six hours were flown by three airplanes and no less than 86 landings were made in the field, about half of which were unsupported, to accomplish this program. In addition to the photographic work, data were obtained in various branches of science and it was determined that the Antarctic Continent is not divided by a frozen body of water extending from the Ross Sea to the Weddell Sea.

D-11936
Stoddart, D.
BUCHANAN--THE FORGOTTEN APOSTLE. Geographical magazine, Sept. 1972 44(12), p.858-862
G1.G343

J.Y. Buchanan was the chemist on board HMS Challenger during its ocean surveying expedition from 1872-1876 which included the Southern Ocean. He was responsible for deep sea and surface temperature and salinity measurements, and identified the first nodules dredged from the sea floor as manganese nodules. He amassed a vast amount of information on the physical and chemical characteristics of the oceans, and his map recording the specific gravity of ocean water was the first map of oceanic salinity ever drawn. His work on the structure of ice and glaciers sprang from his observations of sea ice as Challenger sailed across the Southern Ocean to Kerguelen in 1874. He also initiated formal geography teaching at Cambridge U. in Oct. 1889. Of all of the Challenger scientific staff Buchanan was probably the most accomplished technically, but he has been undeservedly forgotten.

D-11937
Deacon, M. , Deacon, G.
FIRST OCEANOGRAPHIC EXPEDITION. Geographical magazine, Sept. 1972 44(12), p.863-866
G1.G343

The explosion of interest in marine life which took place among biologists in the mid-19th century and the development of power-aided methods of sounding and sea floor sampling, in conjunction with the surveys of submarine cable routes carried out by the Royal Navy's surveyors, formed the origins of the Challenger expedition. The expedition's success lay in bringing these two fields of activity together. The Challenger expedition saw the birth of oceanography as a science and was the first major voyage of discovery to be devoted primarily to marine research. From Dec. 1872 to May 1876 the Challengervisited most of the major oceans and sailed around the world. Oceanographic observations and biological collections were made in the Southern Ocean during the expedition.

D-11938
Yonge, M.
DREDGING LIFE FROM OCEAN DEPTHS. Geographical

magazine, Sept. 1972 44(12), p.867-870
G1.G343

One objective of the Challenger expedition was to examine the distribution of organic life throughout the areas traversed, especially in the deep ocean bottoms and at different depths. During the course of 68,890 nautical mi, 362 observing stations were established, at most of which bottom fauna was procured by means of dredge or trawl and the fauna at the surface and at intermediate depths was sampled with the use of tow nets. Collections were systematically made and shipped home from all depths and all latitudes -- sometimes with risk as when Challenger penetrated among Antarctic icebergs. About 7000 species of deep-sea animals were collected, half of them new to science, and 40 volumes were prepared dealing with the collections.

D-12155
JOINT EXPEDITION SAILS TO AUCKLAND ISLANDS.
Antarctic, Dec. 1972 6(8), p.272

Twenty-nine scientists from New Zealand, Australia, and the U.S. sailed to Auckland Is. last month on an expedition organized by the Department of Lands and Survey. They will remain there until early March to do research aimed at improving knowledge of the islands and its plant and animals, both native and introduced. Studies will be conducted on the relationships between the animals and the flora and fauna, the distribution of chlorinated hydrocarbon pollutants, and various mosses and lichens. The research vessel Acheron will transport equipment and scientists from point to point and provide support.

D-12161
80-DAY INLAND TRAVERSE FROM SYOWA IN 1973-74.
Antarctic, Dec. 1972 6(8), p.284-285

An 80-day inland glaciological traverse from Showa Station towards the Yamate Mountains, in the 1973-74 season, the launching of seven upper atmosphere sounding rockets near winter, and the temporary occupation of Mizuho, the small inland camp 185 mi southeast of Showa, are among the planned activities of the 14th Japanese Antarctic Research Expedition for 1972-74. Most of the JARE 14 scientific activity will be a continuation of last year's programs. Field surveys in various scientific disciplines will be carried out near Showa, and during the summer a new weather observation hut about 240 sq yd in area will be erected. Work aboard the Fuji will include physical, chemical, and biological oceanographic observations, and upper atmosphere physics. Marine meteorological observations will be made by the ship's weather office. The glaciological traverse team will work mainly on a resurvey of strain grids and strain triangle nets installed in the summer of 1969-70. Summer and winter party personnel are listed.

D-12162
FRENCH FORCED TO TERMINATE WILKES LAND TRAVERSE.
Antarctic, Dec. 1972 6(8), p.286-287

Continued mechanical trouble, difficult terrain, bad weather, and low temperatures, have forced the French scientific traverse party to terminate at the 400 km mark the last stage of its 2000 km two-year journey across Wilkes Land to the Soviet Vostok Station. Because of similar difficulities last season the party could not push beyond the 800-km mark although plans were based on covering 1000 km. The Wilkes Land traverse, which is the main scientific project in the French program this season, is part of the International Antarctic Glaciological Project in which the participants are France, the United States, the Soviet Union, and Australia. The first French objective was to link Dumont d'Urville in Adelie Land with Vostok.

D-12163
LARGE WINTER TEAM AT BORGA BASE THIS YEAR.
Antarctic, Dec. 1972 6(8), p.288

South Africa's 14th Antarctic expedition will sail in the research ship RSA for SANAE Station in western Queen Maud Land from Cape Town on Jan. 6 and is expected to arrive by Jan. 20. Two geologists, a surveyor, two mechanics, and a technician will comprise the winter team at Borga Base, 235 mi south in the Borga Massif. Two new tracked vehicles will be sent south in the RSA -- one with hydrostatic and the other with automatic transmission -- and their performance studied. Five South African biologists will travel to Marion I. aboard the French supply ship Gallieni, and Prof. E.M. van Zinderen Bakker, program director of the biological program, will visit Marion and Prince Edward Is., his first visit since the successful biological and geological reconnaissance during 1965-66.

D-12164
MACQUARIE ISLAND FLORA ENDANGERED BY RABBITS.
Antarctic, Dec. 1972 6(8), p.289

The ANARE's 25th season began with the transport of passengers and a relief party of 17 from Melbourne to Macquarie I. on the Nella Dan. The party will carry out research in geophysics, upper atmosphere physics, biology and medical science, and collect meteorological data. Work will continue on the long-term project to control rabbits which were introduced by the sealers many years ago and which are now endangering the flora on the island. Eight Gentoo penguins were brought back to the Melbourne Zoological Gardens.

D-12165
NEW STATION ON HOBBS COAST MAJOR PROJECT THIS SEASON. Antarctic, Dec. 1972 6(8), p.290

More than 700 scientists, seamen, airmen, builders, and other specialists will take part in the program of exploration and research planned by the Arctic and Antarctic Institute. Soviet scientists will continue investigations on the coast and in the central regions of the Antarctic, and in the waters of the Southern Ocean. They will perform a wide range of meteorological, geophysical, glaciological and other investigations, and also launch rockets to probe the upper atmosphere. Exploration of the mountains inland from the MacRobertson Coast will be resumed and deep seismic probing of the Antarctic ice cap will be carried out. A new station -- Russkaya -- will be established at Cape Burks on the Hobbs Coast of Byrd Land. It will be the sixth coastal station established by the USSR and will operate all year round. Joint research will be conducted under the International Antarctic Glaciological Project, and a Soviet traverse will be made from the coast in the direction of the South Magnetic Pole, during which glaciological and magnetic observations will be made and the ice cap will be studied. Modern scientific instruments, vehicles, and an electronic computer have been provided for this season's expedition.

D-12234
Gerlache de Gomery, G. de
PROPOSED EUROPEAN ANTARCTIC EXPEDITION. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.15, 28

Ten European nations (Austria, Belgium, France, Holland, Italy, Norway, West Germany, United Kingdom, Sweden, and Switzerland) have been engaged since 1971 in the preparatory study for a European Antarctic Expedition. Three working parties -- on space biophysics, geodynamics, and polar research -- were set up at the request of the Council of Europe. Final decision for the expedition and finances are the responsibilities of the governments. Planned measurements for the first part of the program, which will study present environmental conditions, will include: parameters connected with recent changes of climate; parameters connected with pollution of the earth, including concentrations and cycles of different elements; and comparative variations of natural elements. Measurements for the second part of the program, which will investigate the history of the earth's climatic environment, will include: a general survey of the area; detailed studies at seven or eight special sites on the ice divide and on a flow line; deep drilling; and past and present behavior of the ice sheet at selected sites. The program will extend over several years. A preliminary estimate of $17 million was proposed to cover 5 yr.

See also:
A-10078, A-10104, A-10422, A-10455, A-10456, A-10467, A-10501, A-10550, A-10561, A-10613, A-10639, A-10669, A-10684, A-10821, A-11004, A-11005, A-11869, A-11871, A-11875, A-11876, A-11877, A-11879, A-12014, A-12244, B-10176, B-10177, B-10210, B-10259, B-10286, B-10364, B-10459, B-10705, B-11044, B-11111, B-11112, B-11113, B-11114, B-11115, B-11116, B-11117, B-11118, B-11119, B-11120, B-11121, B-11122, B-11123, B-11124, B-11125, B-11126, B-11127, B-11128, B-11129, B-11130, B-11131, B-11132, B-11133, B-11134, B-11135, B-11136, B-11137, B-11138, B-11139, B-11140, B-11141, B-11380, B-11384, B-11385, B-11386, B-11388, B-11401, B-11429, B-11692, B-11693, B-11694, B-11695, B-11696, B-11697, B-11698, B-11699, B-11700, B-11701, E-12232, C-10270, C-10539, C-11106, C-12200, E-10008, E-10009, E-10010, E-10011, E-10207, E-10307, E-10386, E-10996, E-11107, E-11109, E-11110, E-11673, F-10147, F-10148, F-10154, F-10155, F-10157, F-10267, F-10413, F-10631, F-10730, F-10735, F-10987, F-11158, F-11204, F-11214, F-11402, F-11802, F-11803, F-11804, F-11805, F-11806, F-11807, F-11808, G-10231, G-10233, G-10349, G-10746, G-11033, G-11606, G-11607, G-11608, G-11609, H-11183, H-11212, H-11347, I-10005, I-10411, I-10599, I-10702, I-10703, I-10757, I-10880, I-10897, I-11105, I-11407, I-11809, I-12015, I-12039, J-10135, J-10136, J-10137, J-10291, J-10292, J-10293, J-10294, J-10300, J-10301, J-10365, J-10366, J-10388, J-10420, J-10421, J-10442, J-10779, J-11039, J-11070, J-11144, J-11270, J-11369, J-11390, J-11492, J-11603, J-11604, J-11605, J-11710, J-11718, J-11719, J-11721, J-11722, J-11723, J-11856, J-11857, K-10004, K-10042, K-10043, K-10048, K-10061, K-10396, K-10407, K-10408, K-10598, K-11161, L-10824, L-11108, L-11501, L-11797, L-11810, L-11811

E. GEOLOGICAL SCIENCES

E-10008
Yoshida, M. , Ando, H.
GEOLOGICAL SUPVEYS IN THE VICINITY OF LUTZOW-HOLM BAY AND THE YAMATO MOUNTAINS, EAST ANTARCTICA. REPORT NO. 1 OF THE GEOLOGY SECTION OF THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. Antarctic record, Jan. 1971 No.39, p.46-54

Geological surveys and petrological analyses were carried out between Jan. 1969 and Feb. 1970. Ice free areas in the vicinity of Lutzow-Holm Bay and the Yamato (Queen Fabiola) Mts were surveyed on scales of 1/100,000 and 1/2000. A helicopter in the summer season and a snow vehicle in the other seasons were used as a means of transportation. The Lutzow-Holm Bay area consists mainly of gneisses characterized by alternating basic and acid bands, gneissose granodiorite, garnet-bearing gneissose granite, pink potash feldspar gneissose granite, and biotite granite. In the Yamato Mts, syenites are well developed while the gneissose granodiorite is absent. The petrographic features, structural characteristics and metamorphic history of the rocks in the area are briefly described.

E-10009
Yoshida, M. , Ageta, Y., Yagi, M.
NEWLY FOUND INLAND MORAINE FIELDS NEAR SYOWA STATION IN 1970. Antarctic record, Jan. 1971 39, p.55-61, In English with Japanese summary. 3 refs.

The inland traverse party of JARE-10 made a preliminary survey in Jan. 1970 of the moraines near the Showa Station area, at 1600 m above sea level. The location, size, topography, constituents, and snow and ice of the moraine area are described. The source of the moraine area may be a nunatak or subsurface rise of bedrock resulting in a surface or shear moraine. It is not clear whether the morainic horizon rose or whether the superposed snow and firn were eroded to expose the moraines.

E-10010
Yoshida, M. , Ando, H., Omoto, K., Ageta, Y.
DISCOVERY OF METEORITES NEAR YAMATO MOUNTAINS, EAST ANTARCTICA. Antarctic record, Jan. 1971 No.39, p.62-65

The find of 9 meteorites by a traverse party of JARE-10 at the SE end of the Yamato (Queen Fabiola) Mts consisted of 8 chondrites and 1 achondrite. The existence of moraine areas at the E margin of the nunataks of the Yamato Mts suggests that the movement and the structure of the ice sheet in the area may account for the concentration of the meteorites, and that more may be found.

E-10011
Ando, H. , Yoshida, M.
SAMPLING OF BOTTOM SEDIMENTS IN THE VICINITY OF THE ONGUL STRAIT, EAST ANTARCTICA. REPORT NO. 2 OF THE GEOLOGY SECTION OF THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. Antarctic record, Jan. 1971 No.39, p.66-70

Four medusae, 4 hydromedusae and 1 scyphomedusa from the Antarctic, including a new species of Rathkea, the genus hitherto only known in the Northern Hemisphere, are described. The collection contains Halitiara sp., Calycopsis borchgrevinki (Browne, 1910), Rathkea antarctica n. sp., and Cyanea juv. Based on field observations, there is a wide distribution of dark blue-gray homogeneous clay silt, with gravel or basal rock at sites shallower than tens of meters. Diatoms and shell fragments were found in samples obtained by coring and dredging to depths of 36 to 598 m.

E-10018
Schopf, J.M.
RELATION OF FLORAS OF THE SOUTHERN HEMISPHERE TO CONTINENTAL DRIFT. Taxon, Oct.1970 19(5), p.657-674

QK1.T34

Recent studies of crustal mechanics by geophysicists show that sea-floor spreading can serve as an adequate mechanism for continental drift and can be important in explaining the distribution of ancient plants of the Southern Hemisphere. The permian Glossopteris flora of southern continents contrasts strikingly with the Permian flora of the Northern Hemisphere. Fertile structures of glossopterids seem to provide the only reliable basis for determining botanical relationship. The Glossopteris flora is, in general, extremely distinctive and consists taxonomically of a relatively small array of plants which occurs over an exceptionally large area. It represents an ecologic assemblage with both climatic and edaphic implications. A tentative Permian Gondwanaland reconstruction is presented that is more likely to have had a reasonably consistent, seasonal temperature climate in keeping with consistent similarities of the Glossopteris flora. According to this interpretation, most of the present area of the Indian Ocean seems to have been occupied by Permian Gondwanaland.

E-10052
Ravich, M.
WHAT WAS GONDWANALAND LIKE? Kakoi byla Gondvana?. Nauka i zhizn', Sept.1971 No.9, p.91-96, In Russian.

The author previews his forthcoming book "Zagadka Gondvany" (The Riddle of Gondwana). Hypotheses of continental drift of Gondwanaland, supported by scientitific data, are discussed. The results of studies on paleomagnetism, paleobotany, paleoclimatology, and structural geology of continents and oceans and their bottoms in the Southern Hemispnere indicate a resemblance among South America, Africa, India, Australia, and Antarctica, as if they had belonged to the same megacontinent in the past.

E-10055
Schlich, R. , Delteil, J.R., Moulin, J., Patriat, P., Guillaume, R.
EVIDENCE OF CONTINENTAL MARGINAL SEDIMENTATION ON THE KERGUELEN-HEARD PLATEAU. Mise en evidence

d'une sedimentation de marge continentale sur le plateau de Kerguelen-Heard. Academie des sciences, Paris. Comptes rendus hebdomadaires des seances. Serie D, April, 1971 272(16), p. 2060-2063, In French. 5 refs.

Seismic reflection soundings made in 1970 during the Galieni 3 expedition along 4 routes covering the Kerguelen-Heard plateau are reported. The 4 profiles reveal a sedimentary sequence having a thickness up to 2.5 sec double seismic travel time. The structural and sedimentary features observed show most of the characteristics of sedimentary basins adjacent to continents, which is taken as a strong argument for assuming the Kerguelen-Heard plateau to have a continental structure.

E-10070
Stubbs, G.M.
FELDSPARS FROM THE FOYN AND BOWMAN COASTS, GRAHAM LAND. British Antarctic Survey bulletin, June, 1971 No.24, p.1-10, 36 refs.
QH84.2.B72

Five new chemical analyses of potash feldspars, together with their X-ray and optical data and that of five other potash feldspars, from igneous and metamorphic rocks from the east coast of Graham Land are presented. The zoning and twinning of coexisting plagioclases are briefly outlined, and some quantitative measurements on the types of twin forms present in the different rocks are recorded. No important petrogenetic conclusions are reached because of the incompleteness of the present study, but several aspects are suggested as topics for future more representative investigations. (Auth.)

E-10073
John, B.S. , Sugden, D.E.
RAISED MARINE FEATURES AND PHASES OF GLACIATION IN THE SOUTH SHETLAND ISLANDS. British Antarctic Survey bulletin, June, 1971 No.24, p.45-111, 104 refs.
QH84.2.B72

Four distinctive landform groups have been recognized in the South Shetland Is.: (1) the flights of surfaces and platforms, cut in rock between c. 275 m above and 110 m below sea level, which are fundamental subaerial and marine features of the islands; (2) the glacial features (erosional and depositional) which have sometimes been modified by periglacial processes; (3) the pockets of beach material overridden by ice which are found in situ between c. 55 and c. 275 m a.s.l. and which are inconspicuous but significant features in some localities; and (4) the undisturbed raised beaches which occur up to an altitude of c. 54 m and are characteristic of the sheltered coastal areas. After a reconstruction of the stages of landscape evolution, the South Shetland Is. evidence is reviewed in the light of evidence from elsewhere in Antarctica and Fuego-Patagonia.

E-10082
Willett, R.W.
GEOLOGY. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.53-65, 40 refs
QC801.3.S6

An account is given of geological work carried out in Antarctica during the period 1957-60. Field expeditions in various parts of Antarctica collected rocks for palaeomagnetic studies and age determination. Apart from the United Kingdom (Falkland Islands Dependencies Survey), which had undertaken geological work for some time in the course of their normal program, the New Zealand activities during the Commonwealth Trans-Antarctic Expedition (1955-58) were probably the most extensive in the field of regional geology during this early period. Geological work was also done in the Weddell Sea sector of the Commonwealth Trans-Antarctic Expedition's transpolar traverse. New Zealand has continued its geological field program, because the Ross Dependency possesses the greater part of the exposed rock of Antarctica within its boundaries; both official and privately organized geological and survey parties have participated in this work. The amount of geological work undertaken by the United States increased towards the end of this period and several major geological expeditions were placed in the field.

E-10089
Nikolaev, N.I.
MAP OF RECENT TECTONICS OF THE WORLD. Karta noveishei tektoniki mira. Geomorfologiia, Oct.-Dec. 1970 No.4, p.3-17, In Russian with English summary. 29 refs.

An attempt is made to compile a general survey map with a unique legend of global tectonics, including the Antarctic, and ways of showing the regions of neotectonic forms. A new classification of structures for the neotectonic stage of development is given. The fault structure of the earth's crust is proved. New fractures of global scope are shown. In considering upper mantle thickness, a relationship of geoidal variations and ellipsoidal anomalies is established. The matter of establishing the lower limit of the neotectonic stage is discussed. New phenomena occurring in the most recent stage of the Earth's tectonic development and the importance of compiling special worldwide neotectonic survey maps are pointed out.

E-10099
Simpson, G.G.
REVIEW OF FOSSIL PENGUINS FROM SEYMOUR ISLAND. Royal Society of London. Proceedings. Series B, Sept. 1971 178(1053), p.357-387, 35 refs.
Q41.L7

Two collections of fossil penguins have been made from Seymour I., off the northeastern end of the Antarctic Peninsula, one by a Swedish expedition in 1901-1903 and the other by a British expedition in 1946. The age has usually been considered early Miocene but is probably late Eocene. Wiman in 1905 based six then new generic and specific names on the Swedish collection. Anthropornis nordenskjoeldii and Delphinornis larsenii are considered valid. Pachypteryx grandis is a valid species but is transferred to Anthropornis. Eosphaeniscus gunnar is a valid species transferred to Palaeeudyptes, a genus otherwise known from New Zealand and Australia. Orthopteryx gigas and Ichtyopteryx gracilis are considered essentially indeterminate, as are two groups of bones not named by Wiman. Marples named genus and species Notodyptes wimani from the British collection. The species is accepted but transferred to the New Zealand genus. Archaeospheniscus. Wimanornis seymourensis, new genus and species, is based on a British specimen. The penguin fauna is essentially similar to the early (late Eocene and early Oligocene) faunas known from New Zealand. The ecological evidence suggests that these penguins lived in considerably warmer waters than those of the present Antarctic coast. (Auth. mod.)

E-10112
Clapperton, C.M.
ANTARCTIC LINK WITH THE ANDES. Geographical magazine, Nov. 1971 44(2), p.124-130
G1.G342
The Subantarctic island of South Georgia provides geological and glaciological links between the Chilean Andes and the Antarctic Peninsula. 1968 studies showed that an ice cap may have covered South Georgia completely only 10,000 yr ago. Since glaciers on South Georgia appear to be very sensitive to climatic fluctuations, a useful appreciation of trends in world-wide changes in climate may results from continuous observations of the glaciers. The island also provides an invaluable link in the correlation of late Pleistocene glacial stages within the southern hemisphere.

E-10132
Frolov, A.I.
DENSITY OF ANTARCTIC SUBGLACIAL ROCKS ACCORDING TO GEOPHYSICAL DATA. Plotnost' porod lozha lednika Antarktidy po geofizicheskim dannym. Morskie gravimetricheskie issledovaniia, 1969 No.4, p.92-100, In Russian. 10 refs.
QB335.M6
Geological sutudies showed that rock densities in Antarctica vary from 1.9 to 3.1 gr/cu cm. Rocks from East Antarctica have a mean density of 2.69 gr/cu cm, and those from West Antarctica of 2.59 gr/cu cm. Rocks with densities of 2.8 - 3.1 gr/cu cm predominate in the coastal zone and, perhaps, correlate to the crystalline basement of the platform. It is concluded that the platform in West Antarctica extends to the central part of Marie Byrd Land. Data on density distribution in rocks can be used to determine subglacial topography and ice thickness more accurately.

E-10142
Konovalov, G.V.
GLACIOLOGICAL AND GEOMORPHOLOGICAL CHARACTERISTICS OF THE WESTERN PART OF EAST ANTARCTICA. Gliatsio-geomorfologicheskaia kharakteristika zapadnoi chasti Vostochnoi Antarktidy. Leningrad, Gidrometeoizdat, 1971, 123 p., In Russian. 242 refs.
A summary of glaciological and geomorphological studies carried out by Soviet non-soviet scientists in the western part of East Antarctica is presented in three chapters: 1) History of research; 2) Physiographic description, including: a) Orography; b) Geological structure and tectonics; c) Climate; d) Off-shore sea waters; e) Continental waters; and f) Fauna and flora; and 3) Glacial and geomorphological characteristics, including: a) Ice cover; b) Relief-forming factors and processes; c) Types of relief; and d) Geomorphological zoning.

E-10143
Umpierre Urquhart, M. , Halpern, M.
RUBIDIUM-STRONTIUM AGES IN CRYSTALLINE ROCKS SOUTHERN URUGUAY. Edades estroncio-rubidio en rocas cristalinas del sur de la Republica Oriental del Uruguay. Asociacion geologica Argentina. Revista, 1971 26(2). Texas University. Contribution No.172, 1971, p.133-151, In Spanish with English summary. 18 refs.
QE1.A7213
Rubidium-strontium ages calculated from total rock and mineral samples of igneous and metamorphic rocks from southern Uruguay fall into three age groups: (1) 1700 to 2000 million year igneous and metamorphic basement rocks of south Uruguay; (2) 500 to 600 million year igneous and metamorphic rocks of southeastern Uruguay; and (3) 120 million year volcanic rocks of Lavalleja Province, southeast Uruguay. These data show that the Precambrian and Cambrian of southern Uruguay are extensions of similar age provinces of Argentina and Brazil. In early Mesozoic reconstruction of Gondwanaland, the geochronologic provinces of southeastern South America are brought into juxtaposition with analagous age belts of southern Africa and West Antarctica. (Auth. mod.)

E-10191
Grushinskii, N.P.
GEOPHYSICAL STUDIES OF ANTARCTICA. Geofizicheskie issledovaniia Antarktidy. Zemlia i vselennaia, Mar.-Apr. 1967 No.2, p.18-26, In Russian.
QB1.Z47
Seismic, gravimetric, and geomagnetic exploration methods used to study glacial and subglacial geology in Antarctica are briefly described. Results of the studies show that Antarctica is divided by the Transantarctic Mts into East and West Antarctica. East Antarctica is a continent, while West Antarctica consists of a large subglacial depression 500-1500 m below sea level and several groups of islands. Antarctica has been isostatically compensated, the equilibrium of the continent having been established after the occurrence of vertical crustal movement caused by great ice loads. Downward movements of parts of the continent have displaced heavy subcrustal masses which have reformed on the periphery of the continent. The Antarctic crustal thickness, 25-35 km in the West and 40-50 km in the East, is comparable to typical continental thickness.

E-10199
International Union of Geological Sciences
GONDWANA STRATIGRAPHY; IUGS SYMPOSIUM, BUENOS AIRES, 1-15 OCTOBER 1967. United Nations Educational, Scientific, and Cultural Organization. Document SC.68/XVII 2. (Earth Sciences, Vol.2), Paris, UNESCO, 1969., 1173p., In English or Spanish. Numerous refs.
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa 7
This symposium was devoted to the study of Gondwana stratigraphy and paleontology. Specialists from different continents spent several weeks on field studies of formations before and after attending the symposium. Their opinions and conclusions are set out in the 80 papers and abstracts which form the present publication. For abstracts of selected papers see E-10200--E10207. Abstracts only appear in this volume for the following report titles: Late Paleozoic Glacial Stratigraphy, Central Transantarctic Mountains, Antarctica, by Velon H. Minshew; Petrology, Paleography and General Stratigraphy of the Beacon Sandstone in South Victoria Land, Antarctica, by Miles O. Hayes et al; Riphean Deposits in the Antarctic Platform Mantle, by D.S. Soloviev; and Structural Outline of the Antarctic Godwana-Type Platform, by L.V. Klimov.

E-10200
Rigby, J.F. , Schopf, J.M.
STRATIGRAPHIC IMPLICATIONS OF ANTARCTIC PALEOBOTANICAL STUDIES. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires, October 1-15, 1967. (Earth Sciences, Vol.2), Paris, UNESCO, 1969.,

p.91-106, 14 refs
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7
Collections made along the Transantarctic Mountains and Sentinel Ranges range in age from Devonian to Jurassic, but most of them are representative of the widespread Lower Gondwana Glossopteris-Gangamopteris flora of the Permian. Fossil species represented can generally be assigned to species reported elsewhere from the middle and upper parts of the Lower Gondwana succession. The Antarctic Permian deposits probably include equivalents ranging from the Great Coal Measures through the Newcastle Coal Measures in Australia. No evidence has been discovered that suggests a late Carboniferous age. Passage from Permian to Triassic is marked by the appearance of Dicroidium.

E-10201
Tasch, P.
ANTARCTIC LEAIID ZONE: SEASONAL EVENTS: GONDWANA CORRELATIONS. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires, October 1-15, 1967. (Earth Sciences, Vol.2). Paris, UNESCO, 1969.. p.185-196, 5 refs.
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7
Microstratigraphic study of the conchostracan Leaia Ledge (Permian) Ohio Range, Antarctica, showed that it was a zone less than 3 ft thick, traceable laterally for 100 ft (faulted out at both ends) and containing barren and fossiliferous portions vertically. The latter indicated seasonal events. Fifteen successive generations of Leaia gondwanella, and two of Cyzicus (Lioestheria) doumanii were represented. Conchostracan occupancy was intermittent and extended through less than one and a half centuries. Several observations bearing on Gondwana correlations are discussed.

E-10202
Briden, J.C.
INTERCONTINENTAL CORRELATIONS BASED ON PALEOMAGNETIC EVIDENCE FOR RECURRENT CONTINENTAL DRIFT. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires, October 1-15, 1967. (Earth Sciences, Vol.2), Paris, UNESCO, 1969., p.421-439, 25 refs.
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7
Paleomagnetism is a sensitive tool for correlation around the time of drift episodes when a small difference in age can be reflected in a large difference between pole positions. On this basis, the relative ages of rocks which were formed around the time of the drift episodes are estimated, and the stratigraphic ages both of these rocks and of the drift episodes themselves are established. Paleozoic glaciation in Australia, India, and most of Antarctica is likely to be younger than the Upper Carboniferous drift episode. The lower Devonian "austral" faunas of South America, the Falkland Is., South Africa, and Australia all occurred in paleolatitudes of less than 40 deg.

E-10203
McElroy, C.T.
COMPARATIVE LITHOSTRATIGRAPHY OF GONDWANA SEQUENCES IN EASTERN AUSTRALIA AND ANTARCTICA. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires, October 1-15, 1967. (Earth Sciences, Vol.2), Paris, UNESCO, 1969., p.441-461, 64 refs.
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7
Lithostratigraphic comparison of Gondwana sequences in the two continents reveals a close similarity of Devonian epiclastic sequences; however, no parallel is to be found in Antarctica to the dominantly acid to intermediate volcanics characteristic of much of the Upper Devonian of Australia. Again, the Eastern Australian Carboniferous sequence of glacigene, volcanic and marine sediments finds no equivalence in Antarctica except possibly correlative tillite in some areas. Permian coal measures of both continents display similarities of lithologic style but the great thicknesses of volcanics and marine sediments, including glacigenes, in Eastern Australia are not known in Antarctica. Similarities and contrasts of the same order are found in the Triassic where, in Australia, some 5,000 m of continental rocks include major sequences of volcanics, coal measures and red beds; the much thinner Antarctic sequence shows no correspondence other than that afforded by carbonaceous remains.

E-10204
Ahmad, F.
POSITION OF AUSTRALIA IN GONDWANALAND RECONSTRUCTION. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires, October 1-15, 1967. (Earth Sciences, Vol.2), Paris, UNESCO, 1969, p.487-519, 83 refs.
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7
The geology of Eastern Australia is compared with that of South Africa, on the one hand, and of East Antarctica, on the other. Emphasis is placed on the occurrence of a number of disjuncts in these landmasses from the lower Precambrian to the Jurassic times. The data are plotted on various reconstructions of Gondwanaland, and it seems indicated that the best results are obtained when East Australia is placed beside South Africa, so that Tasmania lies somewhere near Durban. East Antarctica then fits in snugly beside East Australia, so that Victoria Land lies along New South Wales, and near South Africa. West Antarctica should, therefore, be separated from East Antarctica. It is believed that West Antarctica must have formed originally a separate or partially separate landmass, apparently a continuation of the Andean belt. (Auth.)

E-10205
Schmidt, D.L. , Williams, P.L.
CONTINENTAL GLACIATION OF LATE PALEOZOIC AGE PENSACOLA MOUNTAINS, ANTARCTICA. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires, October 1-15, 1967. (Earth Sciences, Vol.2), Paris, UNESCO, 1969, p.617-649
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7
The Gale Mudstone, a massive tillite, occurs over a 9,000 sq km area in the northern two-thirds of the Pensacola Mountains, Antarctica. Its structure, thickness, lithology, stratigraphy, and composition are described. Continental glaciation is demonstrated through regional correlation throughout the Transantarctic Mountains and Ellsworth Mountains. Although local directional data indicate ice flow from the north, other features - gross regional facies, thickness criteria, and late Paleozoic regional geography suggest that overall continental ice movement was from the continental shield of East Antarctica toward the geosynclinal areas of the Pensacola and Ellsworth Mountains and thence to open seas in or about West Antarctica.

E-10206
Bain, G.W.
CLIMATIC ZONE PATTERNS THROUGH THE AGES. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires,

October 1-15, 1967. (Earth Sciences, Vol.2), Paris, UNESCO, 1969., p.651-671, 39 refs.
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7

Isotherms for past ages, isoflors, zoogeographic indices, and diagnostic sediments have been recorded on globes to show average position of the climatic zones for each geologic age. Considerable variation for extent of a climatic zone is recognized within a geologic period, particularly for temperature relative to latitude and also for the relative humidity index. However the plane of symmetry (equator) to the relative humidity indices and temperature remains the same throughout the major part of any geologic period; a normal to this plane of symmetry gives position to the contemporary polar axis. Major changes in position of poles coincide with outstanding stages in the growth of Laurasia and are coincident with significant modifications in Gondwanaland.

E-10207
Neethling, D.C. , McDougall, I.
PRE-GONDWANA SEDIMENTARY ROCKS OF WESTERN QUEEN MAUD LAND, ANTARCTICA. Gondwana Stratigraphy; IUGS Symposium, Buenos Aires, October 1-15, 1967. (Earth Sciences, Vol.2), Paris, UNESCO, 1969., p.1153-1162
AS4.U8A15 SC.68/XVII.2, DGS, 209 qEa7

A short progress report on geological exploration by the South African National Antarctic Expeditions in western Queen Maud Land is provided. Previous references to the age of the sedimentary sequences exposed to the west of the Greenwich Meridian appear to have accepted a Gondwana correlation based mainly on the subhorizontal attitude of the beds and the occurrence of intrusive dolerite sills and associated volcanics. However, K-40/A-40 dating on dolerite from the northwestern part of the Ahlmann Ridge indicates a Precambrian age for the lower part of the sedimentary rocks. In an appendix entitled Potassium-Argon Dates on Minerals from Dolerites from Western Queen Maud Land, Antarctica, by Ian McDougall, data are presented showing the samples dated to be Precambrian rather than Mesozoic. Due to the loss of radiogenic argon during subsequent reheating, Rb/Sr whole rock dating is suggested as a better method for determining the age of emplacement of the dolerite.

E-10214
Ade-Hall, J.M. , Palmer, H.C., Hubbard, T.P.
MAGNETIC AND OPAQUE PETROLOGICAL RESPONSE OF BASALTS TO REGIONAL HYDROTHERMAL ALTERATION. Geophysical journal, October 1971 24(2), p.137-174 + 6 plates, 81 refs.
QC801.G382

The alteration state of basalt lavas is shown to be largely the result of the combined action of two alteration processes, deuteric oxidation and regional hydrothermal alteration. The former process is well described in the literature while the latter is shown here to be another widespread source of lava alteration. The environment of regional hydrothermal alteration is that of the zeolite metamorphic facies, with temperatures of up to 300 C, and abundant groundwater being the major elements. Independent and rapid spatial variation of the two alteration processes results in the wide range of observed lava properties. The geophysical implications of this widespread post eruption lava alteration process are discussed. The Jurassic tholeiites of the Central Transantarctic Mountains were among the basalt areas for which data were considered.

E-10216
Schopf, J.M.
NOTES ON PLANT TISSUE PRESERVATION MINERALIZATION IN A PERMIAN DEPOSIT OF PEAT FROM ANTARCTICA. American journal of science, Dec.1971 271(5), p.522-543, 37 refs.
Q1.A5

Three generations of primary silica can be distinguished in specimens from a deposit of permineralized peat on Mount Augusta in the central Transantarctic Mountains, Antarctica. Initial chalcedonic mineralization was responsible for preservation of plant tissues. Later chalcedonic mineralization served to consolidate and lithify the rock. Prismatic quartz was deposited last in open cracks and cavities. Deposition of chalcedony is probably related to a fluctuation in the water table when the ground water was highly charged with silica. Later recrystallization of the chalcedony has produced microcrystalline prismatic quartz and destroyed the structure in some of the denser types of plant tissue. Recrystallization may have been induced by heating accompanying the intrusion of Jurassic diabase into adjacent strata. The organic substance of fossils also has been reduced on some surfaces by weathering. Examples of various types of preservation are illustrated. (Auth.)

E-10235
Khain, V.E.
REGIONAL GEOTECTONICS: NORTH AND SOUTH AMERICA, ANTARCTICA AND AFRICA. Regional'naia geotektonika: Severnaia i Iuzhnaia Amerika, Antarktida, Afrika. Moscow, Nedra, 1971, 548p., In Russian. 561 refs.

The structure, tectonics, and historical geology of the crust of North and South America, Antarctica, and Africa are presented in 5 sections. Section 4 on Antarctica includes: Chap. XI, Main structural and topographic features, Geological and geophysical data; Chap. XII, Ancient platform of East Antarctica: (1) Main structural characteristics; (2) Main stages of development; and Chap. XIII, Folded belt of West Antarctica: (1) Main structural features; (2) Main stages of development; and (3) Position of Antarctica in the structure of the Southern Hemisphere; Antarctica and the problem of Gondwanaland. Information on the geotectonics of the Southern Ocean is included on p. 41, 43-45; of the South Orkney, South Shetland, and South Sandwich Is, and the Scotia Arc on p. 285, 325-327.

E-10239
Griffiths, J.R.
RECONSTRUCTION OF THE SOUTHWEST PACIFIC MARGIN OF GONDWANALAND. Nature, Nov. 1971 234(5326), p.203-207, 27 refs.

The geological and tectonic features in the S.W. Pacific provide a framework for the reconstruction of Gondwanaland and the Australia-Antarctic fit is the basis of a reassembly of the continental fragments. To the S and E of New Zealand the Campbell Plateau and Chatham Rise are underlain by continental crust. Typically "continental" rocks outcrop on the islands on these plateaus and these have strong affinities to New Zealand rocks, suggesting that the plateaus are offshore extensions of New Zealand. Marine magnetic profiling results indicate that the Pacific-Antarctic Ridge formed between the Campbell Plateau and West Antarctica during the last Cretaceous (80 m.y. BP) and that a great change in spreading direction occurred in the

early Eocene (50 m.y.). Precambrian basement rocks form the nucleus of Australia and East Antarctica and generally comprise high-grade metamorphics, crystalline intrusives and extrusives and some areas of relativity undisturbed sediments, which together form the "foreland" to the succeeding events. Precambrian rocks form a basement to Lachlan sediments in Tasmania and possible Precambrian rocks occur in Marie Byrd Land, West Antarctica. These sequences and stages postulate the fit of Australia and Antarctica along the 500 and 1000 fathom lines.

E-10245
McGinnis, L.D. , Jensen, T.E.
PERMAFROST-HYDROGEOLOGIC REGIMEN IN TWO ICE-FREE VALLEYS, ANTARCTICA, FROM ELECTRICAL DEPTH SOUNDING. Quaternary research, Sept. 1971 1(3), p.389-409, 28 refs.

Electrical resistivity field measurements and subsequent laboratory analyses of the electrical properties of soils and rocks, both frozen and unfrozen, are used to describe the type and configuration of permafrost in Wright and Taylor Valleys, Antarctica. Rock and soil samples saturated with potable water have resistivities that increase four orders of magnitude when cooled from +21 C to -25 C. Resistivities greater than 10,000 ohm-m are associated with an impermeable variety of permafrost referred to in this paper as confining permafrost. Confining permafrost is continuous throughout the ice-free valleys except near McMurdo Sound and under saline lakes. A hydrologic connection between lakes and the groundwater reservoir beneath the lakes is inferred; thus, part of the brines contained in the lakes may be derived from groundwater. (Auth.)

E-10268
Lamb, H.H.
VOLCANIC ACTIVITY AND CLIMATE. Palaeogeography, palaeoclimtology, palaeoecology, Oct. 1971 10(2), p.203-230, 32 refs.

From a study of the available reports of volcanic eruptions since A.D. 1500 formulae have been developed for numerical assessment of the magnitude of any eruption in terms of the stratospheric dust veil, using indicators of its optical density, maximum extent over the world and effective duration. A cumulative dust veil number is diagrammatically compared with the course of the main climatic changes of recent centuries. The studies make it possible to assess the probable role, and level of importance, of volcanic activity in climatic changes. A very broad, world-wide survey of what is known of the incidence of volcanic activity at various periods in Pleistocene and Postglacial times provides a background which throws further light on this assessment. The cumulative effects of the ejection of volcanic dust, fall-out of Sr-90, poleward transfer of mass, and wind trajectories in the final phases of dust distributions are included in the discussion pertinent to the Antarctic, Subantarctic, and the polar caps. (Auth. mod.)

E-10277
Atrashenok, L.IA. , Klimov, A.V., Avdzeiko, G.V., Silin, IU.I., Krylov, A.IA.
COMPARATIVE DATA ON ABSOLUTE AGE OF ANTARCTIC ROCKS (LEAD AND ARGON METHODS). Sravnitel'nye dannye po absoliutnomu vozrastu porod Antarktidy (svintsovyi i argonovyi metody). Akademiia nauk SSSR. Komissiia opredeleniiu absoliutnogo vozrasta geologicheshkikh formatsii. Trudy, 1967 No. 14. In Russian. 6 refs.

Data are given on the absolute age of various minerals of the same rocks from Queen Maud Land and Enderby Land. Granites from Queen Maud Land had an age of about 445 million yrs., determined by K-Ar methods on biotite, and by the 207Pb/206Pb, 206Pb/238U, 207Pb/235U, and 208Pb/232Th ratios on monazite, which age is very similar to that of other rocks in adjacent areas. Nearly similar values of 500, 540, and 575 million yrs. were determined for the age of zircons from various parts of Queen Maud Land. It is possible that an age of 440-470 million yrs., infers a geological primary datum common for the mineral formation in rocks of Queen Maud Land, corresponding to a stage of superposed metamorphism. The age of chevkinite from Enderby Land near Molodezhnaya Station varies from 1400 to 2120 million yrs. Minerals of similar age were found only in the Vestfold Hills and Adelie Coast.

E-10302
Margolis, S.V. , Kennett, J.P.
PALEOGLACIAL HISTORY OF ANTARCTICA RECORDED IN DEEP-SEA CORES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.175-176, 2 refs

Micropaleontological and sedimentological studies have been carried out on 18 Early to Late Cenozoic deep-sea cores from the Subantarctic Pacific sector of the Southern oceans. Low planktonic foraminiferal diversity indicates a cool southern ocean throughout much of the Cenozoic. Furthermore, in those cores of Early and Middle Cenozoic age, ice-rafted quartz sand, as determined by scanning electron microscope studies, occurs in all cores older than Lower Miocene. Increased species diversity, presence of reworked sand grains, and reduction or absence of typical ice-rafted sands in Lower and Middle Miocene cores indicate a warming trend that ended in the Late Miocene, after which a cooling trend commenced that led to Antarctica's Pleistocene glaciation.

E-10303
Mandra, Y.T. , Mandra, H.
UPPER EOCENE SILICOFLAGELLATES FROM NEW ZEALAND. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.177-178, 3 refs.

Silicoflagellates were collected from selected horizons at 12 Oamaru diatomite localities of South Island, N.Z. The purpose of this preliminary paper on Oamaru material is to record the faunules in terms of the ratios of Dictyocha and Distephanus, which can be used to determine paleotemperatures and to record the general composition of each faunule at the generic level. A number of test slides were made from samples that have already been chemically treated, and it can be reported that silicoflagellate faunules from at least six Oamaru localities appear to be different. These differences, at least in part, seem to be due to paleoecology. Surface and near-surface paleotemperatures for the diatomites at Williams Bluff, Jackson's Paddock, Papakaio (Flume Gully), and Bain's Farm were probably 20 to 25 C. Similarly, for Allan's Farm and Troublesome Gully the data indicate 15 to 20 C. The dual nature of the results cannot be explained. The data support the concept that at least two regions of coastal Antarctica were temperate or warmer during at least a portion of the Upper Eocene. The data also demonstrate that silicoflagellates can indicate Cenozoic marine temperatures fairly accurately.

E-10304
Jendrzejewski, J.P. , Zarillo, G.A..
LATE PLEISTOCENE PALEOTEMPERATURES: SILICOFLAGELLATE AND FORAMINIFERAL FREQUENCY CHANGES IN A DEEP-SEA CORE. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.178-179, 7 refs.

In order to illustrate the potential use of silicoflagellates as paleoecological tools in marine Pleistocene sediments, changes in silicoflagellate and planktonic foraminiferal assemblages have been examined in a Subantarctic core from the South Pacific (Eltanin core 33-22). The core contains the Globorotalia truncatulinoides and Globorotalia inflata zone. Furthermore, five warm intervals are apparent that correlate well with the uppermost five warming peaks of Kennett (1970; E-7895). Silicoflagellate assemblages consist entirely of the two genera Distephanus and Dictyocha. Species present are Distephanus speculum (consisting of seven varieties), Dictyocha antarctica, D. fibula var. aculeata, and D. rhombus. From counts of 200 individuals in each sample, five peaks of high abundance of Dictyocha spp are demonstrated in the core. These intervals are separated by intervals consisting almost exclusively of Distephanus. Furthermore, a close correlation exists between the Dictyocha peaks and warm-water peaks defined by planktonic Foraminifera.

E-10305
Kennett, J.P. , Huddlestun, P.
SUBANTARCTIC LATE PLEISTOCENE CLIMATIC AND PALEOGLACIAL FLUCTUATIONS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.180-181, 6 refs.

The following results have been obtained from investigations of the Late Pleistocene climatic and glacial record in southern ocean deep-sea cores: The paleoclimatic curves for radiolarians and planktonic foraminiferans are in good agreement, therefore confirming the usefulness of both groups in Subantarctic paleoclimatic studies. The radiolarians show a pronounced warming in the lower part of the zone, coinciding with the pronounced warming indicated by the planktonic foraminiferal assemblages. Slight but significant increases in percentage of dextral-coiling Globigerina pachyderma coincide with several in the warm-water oscillations, especially in the Brunhes Epoch. No significant warming occurs in the upper part of the Matuyama Epoch. Paleoclimatic fluctuations indicated by the calcareous nannofossils are in good agreement with those of the radiolarians and planktonic foraminiferans in the upper part of the omega zone but in lower horizons cannot be closely related to those defined by the foraminiferans and radiolarians. Distinct fluctuations in ice-rafted quartz occur down the cores, indicating changes in iceberg activity in the Subantarctic. A general correlation occurs between percent quartz and percent warm-water Foraminifera, thus supporting previous contentious that ice-rafted detritus fluctuate with general climatic changes.

E-10306
Payne, R.B.
PALEOCLIMATIC CHANGES IN ANTARCTIC PELAGIC SEDIMENTS SOUTH OF AUSTRALIA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 181-182, 4 refs.

Present investigations of pelagic sediments include (1) examining changes in microfossil faunas in several cores at and to the south of the Antarctic Covergence, (2) establishing detailed faunal zones for foraminiferal and radiolarian assemblages during the Brunhes Normal Epoch, and (3) determining an accurate climatic curve based on these faunal assemblages in conjunction with paleomagnetic stratigraphy. Results of work on one of the cores being studied (13 m core south of Australia) are shown. The results, based on counts of foraminifera assemblages, do not differ greatly from climate curves shown by Kennett (1969; E-7243) for the Pacific sector of the southern ocean. Preliminary examination of radiolarian assemblages in the same core indicates a good correlation with the foraminiferan-derived curves.

E-10307
Kaesler, R.L.
OSTRACODA IN SOUTHERN CHILE AND IN THE SOUTHERN INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.182

On Eltanin Cruise 47, a total of 44 samples was collected to establish control for studies of depth zonation of benthic Ostracoda in the southern Indian Ocean and to aid in the investigation the hypothesis that the Kerguelen-Gaussberg Ridge system has acted as a barrier to migration of psychospheric Ostracoda. It is also intended that these samples will supplement samples collected on Eltanin Cruise 39 that are being used for study of depth zonation and the development of ornamentation of abyssal Ostracoda. Three studies of species from the Strait of Magellan and environs are nearing completion. The species include Krithe producta, Bradleya normani, and the genus Xestoleberis.

E-10308
Watkins, N.D.
PALEOMAGNETISM AND GEOCHEMISTRY OF IGNEOUS ROCKS FROM CROZET, KERGUELEN, AND AMSTERDAM IS.. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.182-183, 7 refs.

Mean pole positions for the Brunhes Epoch (t = 0 to 0.69 m.) derived from lavas of East and Possession Is. (in the Crozet archipelago) and from Amsterdam I. have been profitably incorporated into analyses of the nature of the geomagnetic dipole, and the secular variation of the geomagnetic field, for the period involved. It is shown that a model proposed for the Upper Tertiary geomagnetic field in which the spin axis from the geocentric position, does not hold for the Brunhes Epoch. It is also demonstrated that the present latitude dependence of the secular variation holds for the Pacific during the Brunhes, except for the region around Hawaii, where the presently atypical very low nondipole activity was maintained during the Brunhes Epoch. The lavas of East and Possession Is. form a flat-lying sequence of oceanites, ankaramites, olivine basalts, and feldsparphyric basalts. Analyses of samples from Amsterdam I. reveal mainly lavas with tholeiitic affinities ranging from olivine tholeiites to plagioclase basalts. Analyses of Kerguelen basalts and plutonic syenites, quartz syenites, and monzonites are continuing.

E-10309
Ostrander, J.H.
PALEOMAGNETIC INVESTIGATIONS OF THE QUEEN ALEXANDRA RANGE, ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.183-185, 6 refs.

The magnetic properties of both volcanic and

intrusive Jurassic rocks were studied in an attempt to establish the relative position of Antarctica for the early Jurassic. Paleomagnetic work on these igneous rocks was backed up by a qualitative examination of the oxidation states of the iron-titanium oxides. Quantitative examination of the opaque minerals is in progress. It is possible that a causal relationship exists between the opaque petrological properties and the magnetic properties in many instances. The results from the Jurassic imply a movement of some 30 degrees of latitude relative to the continent of Antarctica subsequent to the extrusion of the lavas and the emplacement of the minor intrusions.

E-10310
Ford, A.B. , Sumsion, R.S.
LATE PRECAMBRIAN SILICIC PYROCLASTIC VOLCANISM IN THE THIEL MOUNTAINS, ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.185-186, 11 refs.

The Thiel Mountains, an isolated range in the Transantarctic Mountains midway between the Ross and Weddell Seas, consist of variably recrystallized, porphyritic-appearing silicic igneous rocks of probable Late Precambrian age that were intruded by Early Paleozoic granitic plutons. The Late Precambrian rocks are characterized by an unusual coarse-crystal assemblage that includes hypersthene and minor cordierite or their alteration pseudomorphs of chlorite and mica. Microscopic study has yielded much textural evidence for a pyroclastic origin, and the rocks are interpreted as being crystal-rich silicic tuffs. The evidence includes the presence of vague bedding, rare lenticular and eutaxitic structures, and a profusion of broken and embayed, poorly sorted crystals, all of which resemble features of some volcanic tuffs.

E-10311
LeMasurier, W.E.
SPATIAL VARIATION IN CENOZOIC VOLCANISM OF MARIE BYRD LAND AND ELLWSOWRTH LAND. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.187-188, 15 refs.

During the past decade, field and laboratory studies have brought to light several lines of evidence that suggest a continuity of Andean geologic feature, such as Mesozoic plutonism and Cenozoic volcanism, extending from the base of the Antarctic Peninsula across Marie Byrd Land and Ellsworth Land to the Ross Sea region. However, upon closer examination, it appears that there are important discontinuities within the Cenozoic volcanic province of West Antarctica and that the impressions of continuity gained from reconnaissance mapping may be somewhat misleading. Comparison of the volcanic rocks in the central sector of Marie Byrd Land--between longuitudes 110W. and 140W.--with those in the adjacent areas of Ellsworth Land and western Marie Byrd Land, indicates that (1) the volume of basalt in the central sector is much greater and (2) siliceous differentiates seem to be confined to the central sector. The Cenozoic history of central Marie Byrd Land appears to be characterized by extensional block faulting, periodic eruptions of alkali basalt that may have approached flood basalt proportions, and the development of trachytic stratovolcanoes. Rifting was more localized in central Marie Byrd Land, and probably the Ross Sea, than in intervening areas, and continental fragmentation in this part of West Antarctica was largely a Cenozoic event.

E-10312
Colbert, E.H.
TRIASSIC TETRAPODS FROM MCGREGOR GLACIER. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.188-189

Well preserved specimens of early Triassic Antarctic tetrapods have been found at McGregor Glacier. The specimens consisted of articulated skeletons and partial skeletons contained within rather fine-grained siltstones. The initial fossil of the 1970-71 season, an imprint of a complete skeleton of the mammallike reptile Thrinaxodon, a form typical of South Africa, was found on the first day in the field. In addition to the genus Thrinaxodon, other tetrapods, not previously found in Antarctica, have been collected, including several skeletons of the cotylosaurian reptile Procolophon, again a genus characteristic of the South African Lystrosaurus zone, and Pricea. The collections of the past field season strengthen the paleontological ties between Antarctic and Africa during early Triassic time and thus, the concept of continental drift.

E-10313
Breed, W.J.
PERMIAN STROMATOLITES FROM COALSACK COL. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.189-190

Stromatolites (generally considered to be fossil algae) were found in 1969 at Colsack Col, 1 km southwest of Coalsack Bluff, in three zones of the Buckley Formation (Permian). The same formation nearby also contains coal seams up to several feet thick and leaves of the characteristic Gondwana plant Glossopteris. The Buckley Formation is generally considered to have been deposited in a slowly subsiding flood plain with ephemeral lakes and swamps and meandering streams that flowed generally to the east and south. The algae probably flourished in the ephemeral lakes, although many stromatolites have been found in an intertidal marine environment, and this possibility cannot be ruled out.

E-10314
Schaeffer, B.
JURASSIC FISHES FROM ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.190-191

The first Mesozoic fishes from Antarctica were collected during the austral summers of 1966-1967 and 1969-1970 and are now in the collections of the American Museum of Natural History. More than 60 specimens were retrieved from the thin sedimentary interbeds in the Kirkpatrick Basalt of the Ferrar Group in the southern Queen Alexandra Range of the Transantarctic Mountains. On the basis of potassium-argon dating, the age of these beds is Early Jurassic (179 to 161 m.y. old) In addition to the fishes, the varved interbeds contain abundant conchostracans, suggesting that they are freshwater lacustrine deposits. On the basis of the characters revealed by peels, it is evident that this Jurassic form belongs to an order of bony ray-finned fishes called the Pholidophoriformes. The pholidophoriforms gave rise to the teleosts, the most common and highly diversified groups of fishes living today.

E-10315
dalpern, M. , Carlin, G.M.
RADIOMETRIC CHRONOLOGY OF CRYSTALLINE ROCKS FROM

SOUTHERN CHILE. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.191-193, 9 refs.

Ages of total rocks and mineral concentrates from the area bounded by 50 deg 30' to 55S and 68 to 75W. have been calculated. The sampled sites, material analyzed, radiometric decay scheme used, calculated age, and strontium-87/strontium-86 initial ratio used in the rubidium-strontium age calcuations are presented in tabular form. Details of the analytical data will be presented in a later paper that will include potassium-argon dates of mineral concentrates and mafic rocks collected throughout the region. The geologic significance of the radiometric ages is summarized.

E-10316
Wade, F.A.
MARIE BYRD LAND AND ELLSWORTH LAND GEOLOGIC SURVEY. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.193

During the past year, work has been progressing on the preparation of the report that will summarize the geology of coastal West Antarctica from Cape Colbeck, Edward VII Peninsula, on the west to the eastern margin of the Hudson Mountains in Ellsworth Land on the east. During three consecutive austral summers, from 1966-1969, data and specimens were recorded and collected respectively in the field for subsequent study and analysis. These data, combined with those acquired during the Byrd Antarctic Expedition II, 1933-1935, and the U.S. Antarctic Service Expedition, 1939-1941, in Marie Byrd Land will all be used in the preparation of the report, which is expected to be finished in Aug. 1972.

E-10317
Treves, S.B.
GEOLOGY OF THE VOLCANIC ROCKS OF THE ROSS ISLAND AREA, ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.193-194, 9 refs.

Field work in the 1970-1971 season primarily concerned the geology of the summits of Mounts Erebus, Terror, Terra Nova, Bird (all on Ross I.) and Discovery (on the Scott Coast). Petrographic evaluation of thin sections of rocks and consideration of data collected at these locations show that the rocks and geology of the summit areas of the Ross I. area are very similar to the rocks and geology of the lower flanks and coastal areas of the Ross I. area volcanoes. The results confirm the earlier established geologic history and sequence of eruptive events. That sequence is clivine basalt, basalt, and trachyte, which is referred to as the older sequence, and a later sequence consisting of olivine basalt and basalt, which is referred to as the younger sequence. It is suggested that the Ross I. volcanic province is part of a larger province that stretches from the McMurdo Sound area north along the coast of southern Victoria Land through Cape Adare to the Balleny Is.

E-10318
Gunner, J.
IDA GRANITE: A NEW FORMATION OF THE GRANITE HARBOUR INTRUSIVES, BEARDMORE GLACIER REGION. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.194-196, 9 refs.

The name Ida Granite is given to intrusions of aplitic quartz monzonite and granite, and associated aplite and tourmaline-bearing pegmatite dikes typically exposed at Mount Ida and Granite Pillars on the west side of the lower Beardmore Glacier. The Ida Granite contrasts strongly in texture, mineralogy and chemistry with the Hope Granite that surrounds it. The Hope Granite is typically coarser grained, contains more abundant phenocrysts and zenoliths, and is richer in calcium, magnesium, and total iron and poorer in silica than the Ida Granite. The Ida Granite and its associated aplite and pegmatite dikes are here interpreted as late-stage differentiates of the magma from which the bulk of the Hope Granite crystallized. The contrasts in chemistry and mineralogy of the two rock types and the close similarity of their initial Sr-87/Sr-86 ratios support this conclusion. The two rock units have been dated at 463 m.y.

E-10319
Behrendt, J.C.
INTERPRETATION OF GEOPHYSICAL DATA IN THE PENSACOLA MOUNTAINS, ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.196-197

The compilation of aeromagnetic and Bouguer-anomaly maps at 1:250,000-scale has been completed. Computer modeling and other analyses of magnetic data over the Dufek mafic intrusion in the Dufek Massif and Forrestal Range area have shown that the intrusive body extends over an area at least as great as 24,000 sq km. Bouguer gravity anomalies suggest an additional 10,000 sq km outside the area of the magnetic survey. Where the associated gravity and magnetic anomalies extend beneath the ice sheet beyond the north and east edges of the surveyed area, the Dufek intrusion appears to be at least half the size of the Bushveld complex of South Africa. Gravity and magnetic data suggests a total section 6 to 7 km thick. A regression analysis of the Bouguer gravity data in the Pensacola Mountains indicates that the area is probably in regional isostatic equilibrium and that there is an approximate +80-mgal anomaly associated with the Dufek intrusion. The Bouguer anomaly values in the Pensacola Mountains area range from +100 to -90 mgal. Thus the anomaly amplitudes are greater than the terrain errors.

E-10320
Faure, G. , Shultz, C.H., Carwile, R.H.
ISOTOPE COMPOSITION OF STRONTIUM IN VOLCANIC ROCKS FROM DECEPTION ISLAND. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.197-198, 7 refs.

Strontium-87/strontium-86 ratios and rubidium and strontium concentrations have been measured in a suite of volcanic rocks collected from Deception I. in 1969-1970. In addition, a number of inclusions or zenoliths that occur in the tuffs associated with the lava flows on Deception have been analyzed to test their relationship to the lavas. The Sr87/Sr86 ratios of the volcanic rocks range between the narrow limits of 0.7030 and 0.7042 and have a mean value of 0.7036 with a standard deviation of 0.0004. The concentrations of rubidium in the volcanic rocks range from 2.6 to 29.7 parts per million, while those of strontium vary between 131 and 361 ppm. The rubidium concentrations are surprisingly low in view of the sodium enrichment of these rocks. The Sr-87/Sr-86 ratios of the inclusions average 0.7033 and are indistinguishable from the ratios of the volcanic rocks.

E-10321
Jones, L.M. , Carver, R.E., McSaveney, E.R.
SEDIMENT ANALYSES OF THE BEACHES OF LAKE VANDA,

WRIGHT VALLEY. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.199-200

Lake Vanda occupies a closed, U-shaped bedrock basin in the western portion of Wright Valley. The lake is perennially ice-covered; the ice thickness averages 4 m. During the summer a meltwater moat forms at the edges. A series of beaches parallels the level of Lake Vanda, indicating fluctuations of the lake to at least 60 m above the present level. A less defined bench at approximately 224 m above the lake may represent a lake level of much greater age. Results of analysis of the grainsize distribution of sediment from the beaches and colluvial mantle of the north shore indicate that the beach sediments differ little from one another and represent no significant alternation of the colluvial sediments from which they are formed. The results suggest that the formation of the higher beaches has taken place under conditions similar to those occurring during the summer at the present time.

E-10322
Jones, L.M. , Ostlund, H.G.
CARBON-14 AGE AND TRITIUM CONTENT OF LAKE VANDA, WRIGHT VALLEY. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.200-201, 3 refs.

The water in Lake Vanda is strongly stratified in density and composition, the chemocline pattern coinciding with density profile. The concentration profiles of potassium and tritium are shown as an example. On the basis of such profiles, the water under the ice cover has been divided into four main layers. Layer 1 represents water presently being added to the lake by the Onyx River; the underlying layers are characterized by increasing density. C14 analyses of lake water samples give potentially reliable ages of 20-70 yr for water at 25 m depth and 2,130 yr for water at 60 m. The paleoclimatic implications of these studies are discussed.

E-10323
Tickhill, T. , Jones, L.M.
DIURNAL GEOCHEMISTRY OF CANOPUS POND, WRIGHT VALLEY, 1969-1970. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.201-202

For 3 days--Jan. 20-22, 1970.--Canopus Pond was sampled at 2- to 3-hr intervals. Biological oxygen demand was determined for each sample immediately after collection by a standard (APHA) chemical method. The variation of dissolved oxygen concentration with respect to time showed marked minima occurring every 24 hr at approx 1100 hr. An aliquot of each water sample was retained for chemical analysis. The concentrations of chloride, calcium, magnesium, and sodium ions showed a periodic fluctuation with minima occurring at approx 12-hr intervals, at 1000-1200 hr and 2200-2400 hr. The following algae were identified from Canopus Pond: Hantzchina amphioxys (Ehr.) Grun. var. Maior Grun.; Phormidium fragile (Menegh.) Gom.; Navicula muticopsis van Heurk (tentative); and Stauroneis anceps Ehr. (tentative).

E-10324
Rundle, A.S.
GLACIOLOGY AND METEOROLOGY OF ANVERS ISLAND: SUBGLACIAL SURFACE OF MARR ICE PIEDMONT. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.202-205, 20 refs.

The piedmont is typical of the so-called "fringing glaciers" of the west coast of the Antarctic Peninsula in that the ice, as seen at the coastal cliffs, is remarkably free of rock debris. This leads to the facile conclusion that the piedmonts are essentially protective agents. Conversely, Holtedahl (1929) believed that the piedmonts are "strandflat glaciers" which are actively cutting planed surfaces at a level controlled by the sea. Subglacial profiles of the Marr Ice Piedmont, however, do not meet the classical description of a strandflat. From considerations of the distribution of surface velocities and calculated basal shear stresses, the present study concludes that there is a zonation of basal conditions that determines the erosive capability of the piedmont. Holtedhal's suggestion that the subglacial surface is of purely glacial origin is unsatisfactory, because the present behavior of the piedmont is not as he described. The explanation that the ice is wholly protective is not acceptable, because the evidence points to selective but active erosion. The origin of the subglacial surfaces must lie, in part at least, with other agents, and it is suggested that they are preglacial and of initial marine origin, later modified by glacial action.

E-10325
Gow, A.J.
ANALYSIS OF ANTARCTIC ICE CORES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.205-206

Recent research has focused on petrofabric analyses of the ice and petrographic and mineralogical studies of volcanic ash layers preserved in the Byrd ice cores. Measurements of c-axis orientations of more than 10,000 crystals has established definitely the existence of a structurally stratified ice sheet in West Antarctica. A slow but persistent increase in c-axis orientation was observed between the surface and 1,137 m depth. By 1,250 m the structure had transformed into a fine-grained mosaic of crystals with their basal planes oriented substantially parallel to the surface of the ice sheet. This fabric (which persisted to 1,800 m depth) is attributed to shear deformation. A rapid transformation to multiple-maxima fabrics below 1,800 m is ascribed to the overriding effect of increasing temperatures in the ice sheet rather than to any significant decrease in stress level. Detailed fabric analysis of a number of fine-grained, cloud bands that occur abundantly in the 1,250 to 1,800 m zone indicates that these bands probably formed as a result of highly localized shear. Visible debris bands in the ice cores have been identified positively as being of direct volcanic origin, i.e., deposited as ash on the surface of the ice sheet. These ash bands are composed predominantly of glass shards, but crystal fragments and lithic chips (mainly of andesite) are also present.

E-10326
Govorukha, L.S.
GLACIOLOGICAL INVESTIGATIONS ON DECEPTION ISLAND, DECEMBER 1970-JANUARY 1971. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.206-207

Glaciological observations on Deception I. revealed a great variety of accumulation conditions, depending upon the exposure of glaciers, the morphology of the accumulation area, and the elevation above sea level. The average multi-annual accumulation for a number of glaciers is 100 g per sq cm. The average equilibrium line is much higher on Deception I. than on other islands in the South Shetlands and King George I. The firn line is 200 to 280 m above sea level. An alternation of firn layers with densities from 0.45 to 0.65 with thin infiltration ice layers is typical of the area.

During ablation the temperature of the upper part of the active layer is about 0C. The influence of young volcanism is seen in the regime of local glaciers, but it manifests itself only to a limited extent.

E-10327
Miagkov, S.M.
ORIGIN OF MORAINES ON THE MCMURDO SOUND COAST, ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.207-208, 3 refs

By means of field investigations and air photographs, the relief and distribution of moraines in the landscape of Brown Peninsula, Black I., Mount Discovery, Ross I., and the Scott Coast from the Bulwark to Spike Cape have been studied. Features of the moraines are described. It is suggested that the moraines have been formed by movement of the Ross Ice Shelf, which touched shallows, broke into pieces, and trapped and lifted debris to its surface by the freezing at the lower and melting at the upper parts of the ice column. They have been raised by a corresponding fall in sea level, which was at least 400 m and took less than 1.2 m.y. The speed of the fall probably varied and it was apparently a result of the uplift of the mountains during the Tertiary and possibly unloading of the ice from the mainland. The prevailing elevations of the moraines (0 to 400 m) correspond to the amount of fall that occurred when conditions were favorable to the formation of the till cover on the floating ice surface.

E-10328
Calkin, P.E.
RADIO-ECHO SOUNDING RECORDS FROM SOUTHERN VICTORIA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.208-209, 6 refs.

Data compiled with 13 flight tracks give a detailed picture of subice topography and ice thickness surrounding the ice-free valley area of southern Victoria Land and of morphostructural characteristics of the inland edge of the Transantarctic Mountains. The smooth subice profile of the lower Wright Valley is more compatible with repeated outlet glaciation than is that of the lower Victoria Valley, where there is evidence of an important amount of erosion by local glaciers. Further, the height of the threshold at the mouth of Victoria Valley explains why the effect of the recent west-moving invasions of the grounded Ross Ice Shelf has been more restricted there than to the south in Wright and Taylor Valleys. In a profile extending through the Ferrar and Taylor Glacier system out onto the Victoria Land plateau, the control of glacier discharge by subglacial bedrock thresholds is well displayed. Ice surface elevations from radio-echo profiling in the McMurado region of the inland plateau appear to confirm the presence of a relatively broad north-south rise in the ice plateau just inland from the ice-free areas. Structural implications of the data are briefly discussed.

E-10329
Craddock, C.
ANTARCTIC GEOLOGIC REPORTS AND MAPS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.209-210, 6 refs.

Work has continued this year on bringing to publication the results of eight seasons of geologic study in parts of West Antarctica. Recent effort has focused on the question of the age and nature of ancient glaciation in the Jones Mountains. Folio 12 of the Antarctic Map Folio Series has now been published and can be obtained from the American Geographical Society. The folio contains (1) 18 regional geologic maps at a scale of 1:1,000,000 or larger, (2) maps of the entire continent at a smaller scale portraying geology, tectonics, fossil and age determination localities, and geomorphic features, and (3) a map of Gondwanaland. There long has been a need for a geologic map of Antarctica at a scale of 1:5,000,000 (a standard scale in general usage elsewhere) to facilitate comparisons between the continents. Although they were published at a small scale, the maps of the entire continent in Folio 12 were compiled on the scale of 1:5,000,000 to allow the subsequent preparation of such a map by combining the data on the individual maps. This map is now in the final drafting stage and should be published shortly.

E-10330
Dort, W.
MUMMIFIED SEALS SOUTHERN VICTORIA LAND. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.210-211

One of the more puzzling of the many interesting features of the dry valleys of southern Victoria Land is the presence there of numerous seal bodies well preserved by desiccation or mummification in the cold, dry environment. These unusual remains were first discovered when land exploration of the region commenced with Captain Scott's first Antarctic expedition of 1901-1904. Since 1957, literally dozens of bodies have been observed by many parties that have undertaken field studies in the area. In the Victoria, Wright, and Taylor Valley systems, mummified seals have been found as far as 66 km inland from McMurdo Sound. Most bodies are on or near the valley floors, especially against easterly facing escarpments or other topographic situations that form cul de sacs impeding easy westward travel. A few seals, however, succeeded in climbing steep slopes or even isolated peaks before dying at elevations ranging up to 1,200 m above sea level. On the basis of all data available from repeated field observations between 1965 and 1970, the writer believes that the slightly desiccated seals have been dead only a few years, that the mummified remains that still have intact or nearly intact pelts are no more than 20 to 30 years old, and that none of the bare skeletal remnants are more than 200 to 300 years old.

E-10331
Cameron, R.E. , Conrow, N.P., Gensel, D.R., Lacy, G.H., Morelli, F.A.
SURFACE DISTRIBUTION OF MICROOGRANISMS IN ANTARCTIC DRY-VALLEY SOILS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.211-213, 6 refs.

Planners for future soft landings on Mars need to know whether a single soil sample taken near the point of landing is likely to be adequate for analysis and life detection or whether several samples taken at various locations would be better. In order to resolve this problem two antarctic dry valleys, McKelvey Valley and Pearse Valley, were selected for systematic sampling of the surface 2 cm of soil for analysis of microorganisms and soil properties. For McKelvey Valley the number of bacteria for 25 samples averaged 2,890 per g soil for all samples. In 30 samples from Pearse Valley the average was 2,790 per g soil. It is suggested that the chances of a successful experiment are enhanced by collecting samples containing more than 10,000 microorganisms per g soil. The species of microorganisms cultured

from the samples showed a prevalance of members of the diphthercid (nocardioid) group of bacteria.

E-10332
Linkletter, G.O.
WEATHERING AND SOIL FORMATION THE THE DRY VALLEYS OF SOUTHERN VICTORIA LAND. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.214, 4 refs.

Laboratory investigations have been completed on 50 soil samples collected from 19 locations in the Taylor Valley region, in Garwood Valley, on The Bulwark, and peripheral to the Hobbs and Walcott Glaciers in southern Victoria Land. Simple statistical analysis of soil properties indicates that many of the soil properties are interrelated and suggests a number of processes that have affected the soils. These include preferential weathering of mafic minerals and lithclogies over felsic components; preferential weathering of plagioclase components; preferential weathering of plagioclase over potassium by chemical weathering; formation of illite and montmorillcnite; control of soil moisture by clay-size particles and hygroscopic salts; changing soluble salt composition with time, and the production of soil profiles by differential weathering with depth. The tendency of the sedimentary rocks of the Beacon Supergroup to physically disaggregate and disappear from the pebble-size fraction of the scils limits conclusicns regarding soil-forming processes. Soils developed on tills of Ross Sea Glaciations II, III, and IV on The Bulwark have nearly identical soil properties and surface weathering characteristics.

E-10333
Behling, R.E.
CHEMICAL WEATHERING IN WRIGHT VALLEY. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 214-215, 2 refs.

Selected weathering indices of profiles from an alpine glaciation chronosequence of lateral moraines on Meserve Glacier are given. The oldest profile in the chronosequence is the Alpine III, with a maximum age cf 2.5 to 3.4 m. y. The Alpine II profile is 600,000 yr old, and the Alpine I moraine has a maximum carbon-14 age of 12,200 yr. The most active chamical weathering occurs where an ice core or ice-cemented layer is near the zero deg C isotherm and at the surface where infrequent summer precipitation moistens the profile. Soluble salt is continually added through precipitation. Selective removal of free-iron oxides from clay-size particles by oxalate and dithionite-citrate treatments indicates the stage of weathering. Under the present conditions, chemical weathering is most active in the Alpine I prcfile and is occurring to a lesser extent in the upper 5 to 10 cm of the Alpine II and III profiles.

E-10373
Ford, A.B. , Tabor, R.W.
THIEL MOUNTAINS PALLASITE OF ANTARCTICA. U.S. Geological Survey. Professional paper, 1971 No.750-D, p.D56-D60, 18 refs.

Two fragments of a pallasite were found on Dec. 7, 1961, at lat 85 deg 23.9 min S., long 86 deg 35.4 min W., in the eastern part of the Thiel Mountains, one of the southernmost mountain groups in Antarctica. The meteorite fragments lay with mcrainal debris on ice, apparently carried from nearby Mount Wrather, but the exact site of impact is not known. The meteorite weighing 28.6 kg, is the largest of four known Antarctic meteorite finds and the only one of pallasitic material. Mineral phases are those typical of pallasites, including olivine (55.7 wt percent) and nickle-iron (38.1 wt percent), and minor troilite and schreibersite. The pallasite is classed with Brezina's Krasnojarsk group (Pk) on the basis of rounded form of the olivine in the metal meshwork.

E-10383
Crowell, J.C. , Frakes, L.A.
LATE PALEOZOIC GLACIATION: PART IV, AUSTRALIA. Geological Society of America. Bulletin, Sept. 1971 82(9), p.2515-2540, Refs.

The distribution of striated pavements, tillite, outwash deposits, faceted and striated stones, boulders preserved in laminated sequence and interpreted as dropped by ice floes, and other records, show that a large part of Australia was glaciated during the late Paleozoic. The piecemeal stratigraphic record indicates that continental ice spread northeastward to Tasmania from highlands bordering the region on the southwest, and northward through glacial valleys along the coast of South Australia. The apparent source region is now under the deep ocean but in the late Paleozoic was probably occupied by then-adjacent Antarctica. The spread northward of continental ice sheets at the end of the Carboniferous corresponds with a rapid shift of paleolatitude as determined from published paleomagnetic studies. Continental glaciers apparently grew when Gondwanaland moved near the South Pole and an unfrozen paleo-Pacific was close by to provide abundant moisture.

E-10384
Anderson, A.T., Jr. , Clayton, R.N., Mayeda, T.K.
OXYGEN ISOTOPE THERMOMETRY OF MAFIC IGNEOUS ROCKS. Journal of geology, Nov. 1971 79(6), p.715-729, 28 refs.

Measurements of O18/O16 ratios in phenocrysts from basalts of Hawaii, Tahiti, Tristan da Cunha, New Zealand, and Ross Island show that isotopic fractionations between mineral pairs are uniform from rock to rock. Typical values of the fractionations, expressed as 1,000 ln a, are: plagioclase-magnetite, 2.1; plagioclase-augite, 0.6; plagioclase-olivine, 0.9. On the basis of the laboratory-calibrated plagioclase magnetite pair, the isotopic fractionations represent a temperature of 1,020 - 1,100 C, in agreement with field observations. For the corresponding mineral pairs in mafic intrusive rocks, the fractionations are about twice as great, indicating temperatures of isotopic equilibration below 800 C, probably as a result of retrograde exchange during slow cooling. (Auth.)

E-10385
Beck, M.E. , Schmidt, D.L.
RESET DIRECTION OF REMANENT MAGNETIZATION FOR UPPER CAMBRIAN RHYODACITIC WELDED TUFF, PENSACOLA MOUNTAINS, ANTARCTICA. U.S. Geological Survey. Professional Paper, 1971 No.750-C, p.C174-C178, 18 refs.

Four magnetically stable samples of rhyodacitic welded tuff from the Upper Cambrian Gambacorta Formation of the Pensacola Mountains, Antarctica, give a paleomagnetic pole position near 52 deg S., 112 deg W. This pole lies about 35 deg from the pole of the Jurassic Dufek intrusion of the northern Pensacola Mountains and lies less than 20 deg from the cluster of poles

for the widely tested Jurassic dolerite samples from the Transantarctic Mountains. In contrast, the rhyodacite pole lies about 90 deg from the Late Cambrian and Ordovician poles for crystalline rocks of the Sor Rondane Mountains and Lutzow-Holm Bay areas of East Antarctica. The rhyodacite probably was remagnetized during a major early Mesozoic orogeny that is well developed in the Pensacola Mountains; the accompanying regional thermal event is marked by weak chlorite-zone metamorphism and a reset K-Ar date on biotite from Upper Cambrian granite.

E-10386
Ritchie, A.
FOSSIL FISH DISCOVERIES IN ANTARCTICA. Australian natural history, Sept. 1971 17(3), p.65-71, 5 refs.

Fossil fish remains were found at several levels at some 12 localities of South Victoria Land and about 2,000 lbs of fossiliferous rock were recovered by the Victoria University of Wellington Antarctic Expedition No. 15 (VUWAE 15) in 1970-71. Devonian fish remains came from the head and trunk armor shields of primitive arctolepid arthrodires, of which only isolated fragments had previously been discovered in Antarctica. Other armored fish, known as antiarchs, were also quite abundant. Bothriolepis, the genus found here, had strange armored pectoral fins articulated to the trunk armor by a ball-and-socket joint. The finest specimen collected during the trip was a crossopterygian, a lobe-finned, air-breathing fish, quite close to a form known as Gyroptychius, found in the middle Devonian sediments of northern Scotland. Other discoveries of interest from these sediments of more than 350 million yrs. ago were partially complete specimens of little ray-finned fish, palaeoniscids, members of the Actinopterygii, and some articulated individuals of acanthodians, little spiny-finned fish which died out in Permian times. The faunal correlations between the Devonian fish of Antarctica and SE Australia will be studied at the Australian Museum in Sydney and at the Bureau of Mineral Resources in Canberra.

E-10395
Nazarov, G.N.
GLACIATIONS AND THE GEOLOGICAL DEVELOPMENT OF THE EARTH. Oledeneniia i geologicheskoe razvitie Zemli. Moscow, Nedra, 1971, 152p., In Russian. 165 refs.

This book describes in general the following: 1) Causes (and their evaluation) of the Earth's glaciations; 2) Processes accompanying the development of the high-latitude glaciations in the Arctic and Antarctic; 3) Processes interrelated with the destruction of the high-latitude glaciations; 4) Cycling of glaciations and the duration of glacial cycles; 5) Short-period movements of atmospheric and hydrospheric masses and their effect on the dynamics and energy state of the Earth; and 6) Effects of glacial periods on the evolution of the Earth.

E-10418
Krylov, A.IA.
NUCLEAR GEOCHRONOLOGY IN PALEOGEOGRAPHY. IAdernaia geckhronologiia v paleogeografii. Akademiia nauk SSSR. Komissiia po opredeleniiu absoliutnogo vozrasta geologicheskikh formatsii. Trudy, 1970 No.15, p.371-376, In Russian. 19 refs.

QE508.A4

Methods used to determine the distribution of oceans and continents, features of topography, and occurrence of sediments during various geological periods are briefly discussed. Rules to use the methods in different conditions for more precise results are described. An analysis of data on the absolute age of terrigenous minerals of iceberg and morainic sediments shows that in the majority of cases the crystalline rocks in Antarctica have an age of 500-600 m.y.

E-10425
Kitching, J.W. , Collinson, J.W., Elliot, D.H., Colbert, E.H.
LYSTROSAURUS ZONE (TRIASSIC) FAUNA FROM ANTARCTICA. Science, Feb. 4, 1971 175 (4021), Ohio State University. Institute of Polar Studies. Contribution No. 201, p.524-527, 8 refs.

Tetrapod skeletons recently found in the Fremouw Formation in the Shackleton Glacier area, Transantarctic Mountains, include several forms that closely compare to South African species. Faunal similarities that confirm a close connection between Antarctica and Africa during the Triassic period lend further support to the concept of Gondwanaland and continental drift.

E-10427
Faure, G. , Elliot, D.H.
ISOTOPE COMPOSITION OF STRONTIUM IN MESOZOIC BASALT AND DOLERITE FROM DRONNING MAUD LAND. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.23-27, 9 refs.

Initial Sr-87/Sr-86 ratios of basalt and dolerite from Dronning Maud Land have a bi-modal distribution with mean values of 0.7037 and 0.7072, assuming that all samples crystallized 170 my ago. The low group has an average rubidium content of 6.5 ppm, while the high group contains 16.9 ppm. Strontium concentrations range from about 145 to 380 ppm and do not correlate with initial Sr-87/Sr-86 ratios. The initial Sr-87/Sr-86 ratios of the basaltic rocks from Dronning Maud Land are lower than those of the Ferrar Group in the Transantarctic Mountains. The former also have lower rubidium concentrations and higher strontium concentrations than the latter. (Auth.)

E-10429
Thomson, M.R.A.
GASTROPODA FROM THE LOWER CRETACEOUS SEDIMENTS OF SOUTH-EASTERN ALEXANDER ISLAND. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.45-58, 21 refs.

Twelve species of Gastropoda are described from the Lower Cretaceous of south-eastern Alexander I. The fauna appears to be essentially Antarctic and only one species, Anchura (?) antarctica (Cox), has been described previously. Two species, Turritella alexandra and Procerithium (Rhabdocolpus) alexandri, are well enough preserved to be described as new. (Auth.)

E-10431
Thomson, M.R.A.
INARTICULATE BRACHIOPODA FROM THE LOWER CRETACEOUS OF SOUTH-EASTERN ALEXANDER ISLAND. British Antarctic Survey. Bulletin, Sept. 1971 No.25, p.85-94, 23 refs.

Two species of Lingula and Discinisca variabilis sp. nov. are described from the Aptian sediments of southeastern Alexander I. The paleoecological implications of these fossils

are discussed and evidence is given which suggests that some of the specimens of Discinisca may have lived attached to terrestrial plant debris found in the same sediments. (Auth.)

E-10435
Jones, J.G. , Dingle, R.V.
SIGNIFICANCE OF UPPER JURASSIC SEDIMENTS IN THE KNYSNA OUTLIER (CAPE PROVINCE). Nature physical science, Jan.17, 1972 235(55), p.59-60, 3 refs.
Includes reply by R.V. Dingle. 1 ref.

Recent interpretations which indicate an Upper Jurassic age for the commencement of the Agulhas Bank and the East/West Gondwana split show that a Cretaceous date for these events (Veevers et al; E-8883) is clearly incorrect (Dingle et al; E-9651). It is suggested that the onset of rift formation (rifting) and the onset of drift (rupture) be carefully distinguished since they are rarely, if ever, synchronous. Also, the new stratigraphic information of Dingle et al, though significant, cannot negate the conclusion that the onset of dispersal or rupture of Africa and Antarctica occurred in the Cretaceous. Dingle replies that the age of the Agulhas Bank dates from the first sediments deposited onto the down-faulted basement and these sediments are at least as old as lower Upper Jurassic. If at the time of the Veevers communication the geology of the continental margin of South Africa favored a Cretaceous age for the inception of the south-west Indian Ocean, the geology as now known favors an Upper Jurassic age for such an event.

E-10472
Kapitsa, A.P.
SUBGLACIAL TOPOGRAPHY OF ANTARCTICA. Podlenyi rel'ef Antarktidy. Nauka i chelovechestvo, 1966, p.136-161, In Russian.

The gravimetric, magnetic, and acoustic sounding methods used by Soviet expeditions in determining subglacial topography, ice thickness, and surface features of Antarctica are discussed. The mass balance of the ice cap and glacioisostatic deflection of the Antarctic bed were studied in relation to the subglacial topography. Results of the various investigations show mean values for height of ice cover, 2300 m; thickness of ice cover, 1900 m; height of subglacial bedrock, 400 m; deflection under the ice load, 500 m; and bedrock height after deglaciation, 900 m. On the basis of the data, the boundary line of Antarctica can be drawn.

E-10473
Avsiuk, G.A. , Kotliakov, V.M.
GLACIERS ARE ASSETS OF OUR PLANET. Ledniki -- bogatstvo nashei planety. Nauka i chelovechestvo, 1969, p.202-227, In Russian.

A popular account is given of studies of high-latitude and high-mountain glaciers of the Earth, including Antarctica. The mass balance and dynamics of glaciers, relationship between climate and snow and ice cover, potential sources of fresh water, a solution for fresh-water deficiency, and paleoglaciological studies are discussed. Studies made during the past 200 yrs are briefly described, and a research program for future studies is suggested.

E-10475
Selby, M.J.
SALT WEATHERING OF LANDFORMS, AND AN ANTARCTIC EXAMPLE. New Zealand Geography Conference, 1970, 6th, Christchurch, N.Z., Vol. I. Proceedings, 1971, p.30-35, 26 refs.

The physical disintegration of rocks by the growth and expansion of crystals of salts in their pores and fissures is a well known phenomenon, but the attribution of landforms to salt weathering is rare. This paper seeks to outline briefly the state of knowledge of salt weathering of rock, and to give examples of salt weathered landforms in the ice-free valleys of McMurdo Oasis in southern Victoria Land, Antarctica. Salts confined in pores and fissures in rocks may undergo three types of change, creating stresses which might lead to rock disintegration: (1) growth of crystals from solution; (2) thermal expansion; (3) hydration. The importance of each process will depend upon temperature, relative humidity, frequency of wetting and drying, the lithology, structure and tensile strengths of the rocks present and the salts involved.

E-10479
Plumstead, E.P.
GONDWANA STRATIGRAPHY. Search, Nov.-Dec. 1971 3(11-12), p.438
Q1.A772

The years 1971 and 1972 are interim years in the Gondwana Sub-commission's main program of holding four main international Congresses at three yearly intervals in different Gondwana continents. These were initiated in India in 1964 followed by the first in South America in 1967 and the second in South Africa, July-Aug. 1970. The final one in what may be regarded as the first round, is due to be held in Australia in 1973. The 1970-71 season in Antarctica has been of great importance from a Gondwana point of view for it provided overwhelming evidence of close Permian-Triassic vertebrate affinities between Antarctica and South Africa and South America. It was also a practical demonstration of the value of scientific collaboration in Gondwanaland for at the invitation of the USA Antarctic Research Committee, Mr. James Kitching of the University of the Witwatersrand played a major part in the finding and the identification of these fossils.

E-10482
Laird, M.G. , Mansergh, G.D., Chappell, J.M.A.
GEOLOGY OF THE CENTRAL NIMROD GLACIER AREA, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.427-468, 30 refs.

Three main sedimentary rock divisions, separated from each other by unconformities, occur in the mapped area. The oldest (Beardmore Group) of late Precambrian age consists of isoclinally folded marble, sandstone, argilite, quartzite and schist. Unconformably overlying this sequence is the Cambrian Byrd Group which consists mainly of limestone and marble, with minor breccia, conglomerate, quartzite, sandstone, and shale. The youngest sediments, which belong to the Devonian to Permian Beacon Supergroup, rest on a flat-lying erosion surface which truncates both older groups. Granite and tonalite (Granite Harbor Intrusives) intrude the Beardmore and Byrd Group sediments, while the Beacon Supergroup is intruded by sills of Ferrar Dolerite. Gabbro (Holyoake Gabbro), probably a deep-seated equivalent of the Ferrar Dolerite, intrudes limestone of the Byrd Group on the Holyoake Range.

E-10483
Selby, M.J.
SOME SOLIFLUCTION SURFACES AND TERRACES IN THE ICE-FREE VALLEYS OF VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.469-476, 12 refs.

Extensive areas of flattened debris in the beds of the Onyx River and other streams of the ice-free valleys of southern Victoria Land, Antarctica are attributed not to flood plain formation but to solifluction. Flattening of the debris sheet is the result of slow flowage of saturated materials above a permafrost table and the presence of boulders on the surface of the deposit is attributed to preferential growth of ice crystals beneath them. The streams are incapable of moving the coarse debris. Solifluction terraces on slopes with a relatively high snowfall are also described.

E-10484
Thompson, D.C. , Bromley, A.M., Craig, R.M.F.
GROUND TEMPERATURES IN AN ANTARCTIC DRY VALLEY. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.477-483, 4 refs.

Measurements of ground temperatures at six depths from 8 cm to 3 m has been made for a two-yr period in an ice-free region at Vanda Station in the Wright Valley. A yearly range of 42 C was observed at 8 cm, with a maximum temperature of 11.6 C being recorded in Jan. 1970. At 3 m the yearly range was 15 C. In the upper layers, fluctuations corresponding to synoptic-scale weather changes are significant but these are damped out below about 50 cm. Continuous recordings have been made for the 8 cm level on a limited number of occasions and examples are presented showing the effects of air temperature and solar radiation changes.

E-10485
Selby, M.J.
METHOD OF GULLY EROSION, TAYLOR DRY VALLEY, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.484-485, 1 ref.

E-10486
Adamson, R.G.
GRANITIC ROCKS OF THE CAMPBELL-PRIESTLEY DIVIDE, NORTHERN VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.486-503, 16 refs.

Three major rock units are present in the ridge system between the Campbell and Priestley Glaciers: (1) Upper Tertiary to Quarternary alkaline volcanic rocks, all included in the McMurdo Volcanic Group; (2) Jurassic flows and sills (the Ferrar Group) with interbedded sediments (the Beacon Group); and (3) a basement complex consisting of complex consisting of ?Precambrian schist (Priestley Formation) intruded by Paleozoic granite plutons (Granite Harbour Intrusive Complex). The granitic rocks of the basement complex are described in this paper. The Granite Harbour Intrusive Complex in the Campbell-Priestley Divide consists of high-level unfoliated post-tectonic plutons of varying size. Five new units are recognized: Dickason Granite (oldest), Corner Tonalite, Northern Foothills Granite, Capsize Adamellite, and Recoil Granite (youngest). The three largest plutons are all of granitic composition, and more basic lithologies either occur in small plutons or are completely absent. (Auth.)

E-10487
Nathan, S.
POTASSIUM-ARGON DATES FROM THE AREA BETWEEN THE PRIESTLEY AND MARINER GLACIERS, NORTHERN VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.504-511, 14 refs.

The following five new potassium-argon dates are reported: Supernal Granite--347 m.y. (biotite); 320 m.y. (hornblende); Dickason Granite--408 m.y. (biotite); Cosmonaut Granite--454 m.y. (biotite); Retreat Hills Schist--461 m.y. (biotite). In the area between the Campbell and Priestley Glaciers emplacement of the post-tectonic part of the Granite Harbor Intrusive Complex and localized metamorphism of the Ross Supergroup took place during the Ross Orogeny between 400 and 530 m.y. The epizonal Admiralty Intrusive Group was emplaced later between 300 and 385 m.y., and was not accompanied by any regional metamorphism. (Auth.)

E-10488
Ballance, P.F. , Watters, W.A.
MAWSON DIAMICTITE AND THE CARAPACE SANDSTONE, FORMATIONS OF THE FERRAR GROUP AT ALLAN HILLS AND CARAPACE NUNATAK, VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.512-527, 24 refs.

Four hundred feet (130 m) plus of current-bedded sandstones and fine lithic conglomerates of Jurassic age at Carapace Nunatak, formerly attributed to the Beacon Group, are shown to consist of re-derived Bacon and primary basaltic volcanic detritus. They are here named the Carapace Sandstone and referred to the Ferrar Group. They are conformably overlain by over 1,000 ft (300 m) of Kirkpatrick Basalt, including a thick hyaloclastite breccia with pillows, and a 50 ft (15 m) intercalation of what is here called Mawson Diamictite. The latter, also Jurassic in age, is also exposed extensively at nearby Allan Hills, where it fills a depression eroded several hundred feet into Permian and Triassic coal measures and sandstones of the Beacon Group. The diamictite consists, like the Carapace Sandstone, of mixed Beacon and basaltic debris, but contains more basalt, is coarser-grained, very poorly sorted, and generally unstratified. More than 1,000 ft (300 m) thick, it was originally called Mawson Tillite. The present study could not confirm the glacial origin, but located pockets of the deposit in what appear to be volcanic vents; in view of the strong evidence of contemporaneity of basaltic volcanism and emplacement of the diamictite, it is concluded that the deposit is most probably one of volcanic mudflows, and possibly explosion breccias. The formation name is therefore changed to Mawson Diamictite, and it is proposed that it be transferred from the Beacon Group to the Ferrar Group. (Auth.)

E-10489
Cole, J.W. , Kyle, P.R., Neall, V.E.
CONTRIBUTIONS TO QUATERNARY GEOLOGY OF CAPE CROZIER, WHITE ISLAND AND HUT POINT PENINSULA, MCMURDO SOUND REGION, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.528-546, 19 refs.

Rocks of the McMurdo Volcanics from Cape Crozier, White Island and Hut Point Peninsula can be correlated with the Melania Basalt, Aurora Trachyte, Nubian Basalt and Trachyte Hill Formations of Black Island. The volcanic cones of Cape Crozier comprise an alternating sequence of basalt and trachyte lavas which rest upon the lower flanks of Mt. Terror. Advances of glacier ice have formed extensive moraine covered beaches

up to 300 m high between the volcanic cones. White island is comprised of two basalt shield volcanoes, with younger basalt cones aligned north-south across them. Five glacial benches on the north coast have been found and pebble types on them suggest that they were probably formed by an expanded Ross Ice Shelf, rather than an enlarged Koettlitz Glacier. The basalt volcanoes of Hut Point Peninsula are aligned NNE. Trachytes occur at the southern end of the lineation at Observation Hill, and autoclastic breccias at the northern end at Castle Rock.

E-10491
Nathan, S.
GEOLOGY AND PETROLOGY OF THE CAMPBELL-AVIATOR DIVIDE, NORTHERN VICTORIA LAND, ANTARCTICA. PART 2--PALEOZOIC AND PRECAMBRIAN ROCKS. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.564-596, 27 refs.

The pre-Mesozoic rocks within the Campbell-Aviator Divide consist of metasediments of the Ross Supergroup that have been intruded by granitic rocks of the Granite Harbour Intrusive Complex. Erosion has largely removed the Ross Supergroup, and this unit is now represented only by small areas of metasediment within and between large granite plutons. Two formations of the Ross Supergroups are recognized. The Priestley Formation consists of biotite and biotite-hornblende schist containing scattered calcareous and metavolcanic bands. The Retreat Hills Schist consists of uniform biotite schist which is thought to be the metamorphosed equivalent of the Robertson Bay Group. The Granite Harbor Intrusive Complex contains four major units--Aviator Granodiorite, Cosmonaut Granite, Northern Granite Complex, and Southern Granite Complex. All the granitic rocks are undeformed and discordant to the structure of the country rock, which suggests that they are wholly post-tectonic. The mineralogy and chemistry of the post-tectonic part of the Granite Harbour Intrusive Complex in northern Victoria Land and the younger Admiralty Intrusive Group are briefly compared. (Auth. mod.)

E-10492
Heine, A.J.
SEICHE OBSERVATIONS AT LAKE VANDA, VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.597-599, 4 refs.

Continuous records of lake levels, and wind speeds and directions at Vanda Station were made over a 6-week period from Dec. 12, 1969, furthering a detailed study in total water volume of Lake Vanda. Samples of measurements made during an easterly and a westerly wind, the predominant ones in summer, are given. Seiche movement is evident at wind speeds of about 15-30 knots. During the easterly (from 070 to 090 deg), approximately 5 wave cycles per hour were recorded, and during the westerly (from 160 to 270 deg), approximately 12. The oscillation of the ice cover of Lake Vanda may be related to activity recorded on the Vanda Station seismograph and reported by Adams (1969; L-7353).

E-10493
Grapes, R.H. , Reid, D.L.
RHYTHMIC LAYERING AND MULTIPLE INTRUSION IN THE FERRAR DOLERITE OF SOUTH VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.600-604, 6 refs.

The Ferrar Dolerite was studied in the northern part of the Boomerang Range, the Warren Range and at Mount Metschel in the Skelton Neve as part of the program of the 1970-71 Victoria University Antarctic Expedition. The northern part of the Warren Range is a dolerite massif some 15 km long and rising to 1 km above the Deception Glacier. Where the dolerite forms slopes, well developed rhythmic layering is visible. The layering is accentuated by snow-covered ledges 1 to 2 m wide separated by vertical risers 3 to 6 m in height. The layers dip at 10-20 deg inwards from the north and south ends of the massif, and towards the Deception Glacier, indicating a shallow basin-like form. The massif grades laterally into thinner sills to the north, east and south and appears to be roughly circular in plan. About 240 m from the top of Mount Warren there is a sharp break in the columnar jointing. The rhythmic layering reflects mineralogical changes within the dolerite and preliminary examination shows the ledges to be composed predominantly of cumulate clinopyroxene and hypersthene.

E-10494
Barrett, P.J. , Kohn, B.P., Askin, R.A., McPherson, J.G.
PRELIMINARY REPORT ON BEACON SUPERGROUP STUDIES BETWEEN THE HATHERTON AND MACKAY GLACIERS, ANTARCTICA. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.605-614, 10 refs.

The Beacon Supergroup in the Transantarctic Mountains is largely a flat-lying, nonmarine sequence from Devonian or older to Jurassic in age. It consists of the Taylor Group (Devonian or older), a quartzose sandstone sequence, and the Victoria Group (Permian and Triassic), dominantly a coalbearing sandstone-siltstone sequence. New discoveries made in the Taylor group during the 1970-71 season included fossilized root and soil structures found in the Aztec Siltstone at Mt. Ritchie, and conchostracans found in association with fish remains in lake beds at Portal Mountains and in the Lashly Mountains. Gangamopteris and well-preserved Glossopteris leaves were obtained from the Weller Coal Measures of the Victoria group.

E-10495
Laird, M.G. , Mansergh, G.D., Ballance, P.F., Barrett, P.J., Neall, V.E., Katz, H.R., Turnbull, I.M.
RECOMMENDED STANDARDS FOR ANTARCTIC MAPS PUBLISHED IN NEW ZEALAND. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.615-617, 1 ref.

A scheme is proposed for use in Antarctic maps of regional coverage published in New Zealand, using colors and symbols. The scheme is a modification of both the United States Geological Survey and the American Geographical Society codes. The symbols adopted denote age and lithological groupings in a similar fashion to the two American series. Although age may not always be known with precision, a broad age range at least can be determined and the appropriate range of symbols used. It is recommended that where rocks cover a wide age range, or their age is not well-defined, the color relevant to the youngest age given be used. Screens and patterns can be employed to denote separate units within the one group or formation. It is also recommended that maps be prepared for publication so that they reduce to one of a limited number of national scales, e.g., 1:50,000, 1:100,000, 1:250,000, 1:500,000, etc.

E-10510
Brook, D.
SCREE BENCHES AROUND ICE-DAMMED LAKES IN SOUTH GEORGIA. British Antarctic Survey. Bulletin. Oct. 1971 No.26, p.31-40, 9 refs.
QH84.2.B72

Scree benches around two lakes dammed by Neumayer Glacier are described and compared. They are considered to be raised beaches formed during periods of higher lake level, when Neumayer Glacier was thicker and in a more advanced state than at present. They were probably formed during the historical past but there is no evidence as to the time interval between individual benches. (Auth.)

E-10512
Thomson, J.W.
GEOLOGY OF MATTHEWS ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin. Oct. 1971 No. 26, p.51-57, 8 refs.
QH84.2.B72

The Mesozoic Spence Harbour Conglomerate unconformably overlies a contorted and brecciated group of the quartz-mica-schists and graphite-schists on Matthews I., South Orkney Is. A basis dyke which cuts the conglomerate is described petrographically. (Auth.)

E-10517
Clapperton, C.M.
GEOMORPHOLOGY OF THE STROMNESS BAY-CUMBERLAND BAY AREA, SOUTH GEORGIA. British Antarctic Survey. Scientific reports. 1971 No.70, 25p., 30 refs.
QH199.B73

The geomorphology of a large ice-free part of South Georgia is described. Pre-glacial erosion surfaces at 20-75, 600-650 and 1,700 - 2,000 m a.s.l., and at 100-200 m below sea level, have been severely modified by glacial erosion which has also produced impressive cirques, troughs and submarine basins, as well as roches moutonnees and knob-and-tarn topography. Glacial erosion was effective as far as 12 km beyond the eastern coastline and to a depth of 270 m below sea-level. The deposits of four glacial stages are recognized; two of these are probably older than 5,500 yr. B.P. and the other two date from the late eighteenth to nineteenth centuries and the early twentieth century. South Georgia was probably completely covered by an ice cap during the oldest stage. Conspicuous terminal- and lateral-moraine complexes and contiguous outwash gravels are typically associated with the three youngest stages. The processess forming contemporary moraines at the ice margins are discussed. Adjacent landforms, such as ice-dammed lakes, raised beaches and patterned ground, are also described. (Auth.)

E-10520
Huddlestun, P.
PLEISTOCENE PALEOCLIMATES BASED ON RADIOLARIA FROM SUBANTARCTIC DEEP-SEA CORES. Deep-sea research. Nov. 1971 18(11), p.1141-1143, 8 refs.
GC1.D25

In order to resolve certain differences in the literature, two of the longest and most complete Southern Ocean Pleistocene carbonate cores (E15-16 and E21-17) were analyzed to compare paleoclimatic curves of three microfossil groups: (1) Radiolaria, planktonic Foraminifera, and calcareous nannofossils. The following results are indicated: (1) paleoclimatic curves for radiolarians and planktonic Foraminifera are in good agreement for cores E15-16 and E21-17, therefore confirming the usefulness of both groups in Subantarctic paleoclimatic studies; (2) the radiolarians show a pronounced warming in the lower part of the omega zone, coinciding with the pronounced warming indicated by the planktonic foraminiferal assemblages; (3) there is no significant warming in the upper part of the Matuyama Paleomagnetic Epoch; (4) the paleoclimatic fluctuations indicated by the calcareous nannofossils are partly in agreement with those of radiolarians and planktonic Foraminifera; and (5) the Globorotalia inflata-Globorotalia puncticulata zone boundary can be used to approximate the Brunhes-Matuyama boundary in carbonate-rich Subantarctic cores.

E-10522
Griffiths, J.R. , Varne, R.
EVOLUTION OF THE TASMAN SEA, MACQUARIE RIDGE AND ALPINE FAULT. Nature physical science, Jan. 31, 1971 235(57), p.83-86, 32 refs.
Q1.N22

Plate tectonic considerations are used to interpret various geological and geophysical data and to construct a speculative two-stage model for the evolution of the Tasman Sea, Macquarie Ridge, and Alpine Fault. Marine magnetic data indicate differential spreading at the Pacific-Antarctic Rise and an anticlockwise rotation of the Campbell Plateau relative to Australia-Antarctica from 80 to 50 m.y. ago. The early stages of seafloor spreading in the Tasman Sea thus developed as a triangular rift at the end of the Pacific-Antarctic Rise. Later differential spreading of Australia and the Campbell Plateau from Antarctica during the Tertiary led to the establishment of a zone of transcurrent displacement through New Zealand and continued spreading in the Tasman Sea. The model indicates that the major transcurrent movement on the Alpine Fault occurred between 50 and 10 m.y. ago.

E-10530
Everett, K.R.
SOILS OF THE MESERVE GLACIER AREA, WRIGHT VALLEY, SOUTH VICTORIA LAND, ANTARCTICA. Soil science, June 1971 112(6), Ohio State University. Institute of Polar Studies. Contribution No. 173, p.425-438, 30 refs.

During the austral summer 1967-68, a soils study was made of a sequence of moraines around the Meserve Glacier produced over the last two million years by an Alpine glacier. Chemical and physical criteria obtained from the soils, when taken together, established a set of reliable indices of relative ages for the moraines. The same information related to the finite ages for the moraines allows the use of the criteria in areas where neither relative nor finite ages are available. It also provides a basis on which to judge soil genesis. The physical parameters investigated included color, texture, presence or absence and amount of free salts, degree of salt induration, and the amount and appearance of granules and cobbles up to 30 cm size (skeleton). Comparison of selected chemical parameters indicated that maximums of SO4, exchangeable sodium and electrical conductivity profiles coincide with the position of the clay peak and the salt-indurated layer. This layer is considered the most significant characteristic of the soils in the Meserve Glacier area.

E-10543
Fraser, R.
GLOBAL DISTRIBUTION OF EULERIAN POLES. Nature, Feb. 11, 1972 235(5337), p.324-325, 4 refs.
Q1.N2

Euler's fixed axis theorem and in another

context as the initial premise in Weyl's geometrical determination of the five finite groups of proper rotations in 3-dimensional space is related to global distribution of Eulerian poles, including the pole at 70 S 118 E. Eulerian poles, five as located by Le Pichon (E-8059), the sixth disclosed as the center of rotation of the "East African Subplate", lie in pairs on or near three great circles. The Scotia Arc and the antipodal Verhoyansk Mts lie alongside the intersections of two of the great circles. A graphical check rates the chance against the possibility that the final pattern of six pairs of Eulerian poles might be a random distribution at more than 20 to 1.

E-10555
Voronov, P.S.
CLOUDS DESTROY ANTARCTIC MOUNTAINS. Oblaka - razrushiteli gor Antarktidy. Chelovek i stikhiia, 1967, p.141, In Russian.
QC851.C39

Rock erosion due to the action of cold was observed in the Conrad Mts., Queen Maud Land, on March 1, 1959. In spite of the low temperature of -17 deg C, snow melt from the mountain slopes filled the crystalline rock crevices, during sunshine. As clouds gathered over the mountains, the freezing of the interstitial water caused splitting of the rocks. These weathering processes are repetitive throughout the Antarctic summer. Despite destruction caused by constant frost, very high solar radiation, and frequent strong storms, the mountains in Queen Maud Land reach a height of 4,000 m. It is explained that the constant uplifting of the Earth's crust in this area is, to a certain degree, a compensating factor in the thermal destruction of rocks.

E-10578
Maegoya, T. , Nohda, S., Hayase, I.
RB-SR DATING OF THE GNEISSIC ROCKS FROM THE EAST COAST OF LUTZOW-HOLM BAY, ANTARCTICA. Kyoto Daigaku. Rigakubu. Memoirs. Ser. B., Dec. 1968 35(2), p.131-138, 11 refs.
Q77.K72

Rb-Sr age determinations have been carried out on rock samples collected in the area along the east coast of Lutzow-Holm Bay, East Antarctica. Two different age groups of 458 my. and 1,110 my. have been obtained from the biotites and K-feldspars, respectively. The present Rb-Sr age of biotites is in close agreement with the determinations in previous works, indicating that the last metamorphic activity occurred in the early paleozoic age. The age of 383 my. of the K-feldspar on the rock from the Yamato Mountains differs widely from those of other samples from the east coast of Lutzow-Holm Bay. (Auth.)

E-10579
Maegoya, T.
GLACIOLOGICAL STUDIES IN THE VICINITY OF SYOWA STATION, LÜTZOW-HOLM BAY, EAST ANTARCTICA. Kyoto Daigaku. Rigakubu. Memoirs. Ser. B, Sept. 1969 36(1), p.1-18, 19 refs.
Q77.K72

There is a marked ablation zone some 15 km wide along the periphery of the Soya Coast, Lutzow-Holm Bay, and here the firn limit has a maximum height of about 600m. A controlled analysis of the snow-firn stratigraphy on the marginal slope of the ice sheet at 700 m elevation was carried out on Nov. 3, 1966. The mean annual net accumulation for the period 1956-1965 was calculated as 7.1 g/sq cm. The incidence of a cyclic pattern of melt-features and icy layering formed during the Antarctic summer is helpful in distinguishing winter layers from summer layers. Examination of the snow-firn stratigraphy at another observation point, 930 m above sea level, shows few melt-features and an average annual net accumulation of 14.2 g/sq cm for the period of 1963-1966. Also, a rather low value of maximum mean annual snow deposition in 1966 (several tens of centimeters of snow depth at the end of October) in the Ongul Strait, suggests low precipitation in the Showa region. (Auth.)

E-10591
Sowerbutts, W.T.C.
RIFTING IN EASTERN AFRICA AND THE FRAGMENTATION OF GONDWANALAND. Nature, Feb. 25, 1972 235(5339), p.435-437, 24 refs.
Q1.N2

Examination of the date indicates that the extensive series of rift faults, known collectively as the East African rift system, results from three separate periods of rifting, and that these periods were associated with the fragmentation of Gondwanaland. The first period occurred in the Triassic-Jurassic associated with the breakup of Madagascar and Africa, and the third began in the mid-Cainozoic associated with the breakup of Arabia and Africa. The latter is still in progress. The main areas of Africa where rift faulting probably occurred during the different periods are shown. These conclusions are consistent with the center of rift activity in eastern Africa having moved northwards with time, but not with the view that the periods of rifting are related by some permanent feature of the mantle localized beneath eastern Africa. If the periods of rifting are related at all, it is because each is associated with a stage in the fragmentation and dispersal of Gondwanaland.

E-10600
Nikolaev, N.I.
MAP OF RECENT TECTONICS OF THE WORLD. Geomorphology, Oct.-Dec. 1970 No. 4, p.277-290, English translation from Geomorfologiia, No. 4:3-17, Oct.-Dec. 1970. 29 refs.
For abstract see E-10089.

E-10605
Patin, S.A. , Tkachenko, V.N.
ACCUMULATION OF ARTIFICIAL RADIOISOTOPES IN SHALLOW-WATER DEPOSITS IN THE SOUTH ATLANTIC. Nakoplenie iskusstvennykh radioaktivnykh izotopov v melkovodnykh otlozheniiakh IUzhnoi Atlantiki. Atomnaia energiia, July 1971 31(1), p.72-74, In Russian. Eng. transl. in: Soviet atomic energy, 31(1), Feb. 1972. 10 refs.

Samples of bottom sediments collected by the Akademik Knipovich in the shallow regions of the South Atlantic Ocean, including areas off the Falkland, South Georgia, South Orkney, Shishkov, and Mordvin Is., in 1967-68 were examined for artificial radioactivity by a gamma-spectrometry method. Data tabulated on the content of Zr 95 - Nb 95 and Ru 106 -Rh 106 in the bottom deposits include station number, date and depth of sampling, and type of sediment. It is believed that the presence of fission products in marine deposits is most probably due to tests of nuclear weapons, and the quantity of isotopes is influenced by oceanographic, and geochemical factors, in addition to precipitation through the atmosphere.

E-10647
Colbert, E.H.
ANTARCTIC FOSSILS AND THE RECONSTRUCTION OF GONDWANALAND. Natural history, Jan. 1972 81(1), p.66-72
QH1.N13

The vertebrate fossil remains discovered in the Transantarctic Mountains of Antarctica provide evidence that the same animals roamed southern Africa and Antarctica 200 m. y. ago and that the southern continents were once a single land mass. Notable finds of Lower Lystrosaurus fauna and associated reptiles and amphibians characteristic of South Africa have been made at Graphite Peak, Coalsack Bluff, and McGregor Glacier. The Lystrosaurus fauna is also found partially represented in peninsular India. Similarities in the continental outlines of Africa, Antarctica, and India suggest a fit that brings the localities of the Lystrosaurus fauna within reasonable range for a terrestrial vertebrate fauna. This demonstration of faunal and continental relationships strongly supports the concept of Gondwanaland and continental drift.

E-10641
Sprigg, R.C.
MINERAL RESOURCES OF THE CONTINENTAL SHELVES. Australian natural history, Dec. 1971 17(4), p.107-112

During the final breaking-up of Gondwanaland about 150-160 million yrs ago, Australia separated away from Antarctica, leaving a widening chasm that left steep rift-like continental slopes on its southern margin. As Australia migrated to the NE away from Antarctica, successions of younger Mesozoic and Tertiary sea floors were in turn pushed up in a series of mountain and extensive sub-sea island arcs. Mostly these disturbed zones of folded sea bottom are the sites of extensive volcanic outpourings, and lie exclusively beyond the Australian coasts. From this type of history determinations may be made on the age, nature mineral potential of deeper sediments. Sediment types of continental shelves and slopes are discussed.

E-10654
Hamilton, W.
HALLETT VOLCANIC PROVINCE, ANTARCTICA. U.S. Geological Survey. Professional paper, 1972 456-C, C1-C62, 87 refs.
QE75.P9

The Hallett volcanic province of upper Miocene to Holocene sodic basalt and trachyte lies along the Ross Sea coast of northeastern Victoria Land. The volcanic rocks occur primarily in four long offshore piles; one wholly an island (Coulman), the other three (Daniell, Hallett, and Adare Peninsulas) joined to the mainland by ice-filled troughs. Each pile is a broad elongate dome formed by eruptions mostly along a crestal fissure zone. Each volcanic dome consists mostly of subglacial palagonitic breccias and pillow-breccia complexes of spectacular character, erupted during late Miocene, Pliocene, and Quaternary times, when the Antarctic ice sheet was grounded on the Ross Sea shelf and was far more extensive than it is now. The breccias are capped by subaerial lavas and scoria. The volcanic rocks belong to a sodic basalt-and-trachyte association. Mafic rocks, particularly alkaline olivine basalt and trachybasalt, are dominant; but more felsic rocks, including latite, trachyte, extremely sodic phonolite, and relatively potassic quartz trachyte, are abundant. (Auth. mod.)

E-10670
SCIENTISTS WILL STUDY MIGRATION OF INDIA. Ocean Industry, March 1972 7(3), p.30
GC1.O22

According to popular theory, India was once attached to a super-continent in the southern hemisphere made up of Africa, Antarctica and Australia, which broke up about 150 m.y. ago. This incredible migration, its path and progress, is the object of study by scientists, who are sampling sediments and rocks deep below the Indian Ocean floor with the Deep Sea Drilling Project drilling vessel Glomar Challenger. Leg 22 of the expedition will study three physiographic provinces of the ocean floor that appear to be related to the movements of India: the Bengal Fan, the Ninetyeast Ridge, and the Wharton basin. It is suggested that the types of sediment and fossils contained in the Wharton basin may furnish information concerning the movements of India, Australia, and Antarctica during the past 150 m.y.

E-10719
Smithson, S.B.
DENSITIES OF METAMORPHIC ROCKS. Geophysics, Aug. 1971 36(4), p.690-694
QE500.G4

Rock densities from seven different metamorphic terrains of Antarctica, Norway, and Wyoming are presented. Mean densities for rock types range from 2.65 gm/cu cm for biotite granite gneiss to 3.04 gm/cu cm for diopside granofels. Mean rock densities for metamorphic terrains range from 2.70 to 2.86 gm/cu cm. Rock density may decrease in the lower part of the upper crust. Most mean rock densities for metamorphic terrains fall between 2.70 and 2.79 gm/cu cm; the mean density of 2.67 gm/cu cm commonly used for the upper crystalline crust is too low. (Auth. mod.)

E-10720
Smithson, S.B. , Murphy, D.J., Houston, R.S.
DEVELOPMENT OF AN AUGEN GNEISS TERRAIN. Contributions to mineralogy and petrology, 1971 33(3), p.184-190, 27 refs.
QE351.H45

Augen gneiss, migmatite, and hornblende gneiss near McMurdo Sound, Antarctica, is interlayered with calcareous metasedimentary rocks on all scales and passes gradationally into quartzofeldspathic gneiss. Field evidence suggests that augen gneiss formed from quartzofeldspathic gneiss by local metasomatism that accompanied strong deformation and smoothed out original metasedimentary differences. Locally partial melting took place. The final result is a sequence of augen gneiss, hornblende gneiss, and migmatite with thin amphibolite lenses and layers. The metasedimentary rocks are correlated with lower grade limestones and calcareous arenites including graywackes 125 km to the south. Augen gneiss and quartzo-feldspathic gneiss have similar chemical compositions, but augen gneiss seems to be somewhat more mafic.

E-10721
GEOCHEMICAL FACETS OF GLOBAL TECTONICS. Nature physical science, March 1972 236(65), p.49
Q1.N22

The potential of geochemical evidence to make reasonable predictions in ocean tectonics is based on a conclusion that the geochemical

pattern of volcanism on the ocean floor is broadly consistent with the tenets of ocean floor spreading, although there are certain anomalies. The conclusion is supported by a consideration of the composition and degree of saturation of magmatic liquids produced by partial fusion of the mantle in different types of ocean floor volcanism. In ridge axis volcanism at Bouvet I. and Iceland, both astride the mid-atlantic ridge, anomalous conditions exist. In volcanism associated with linear fractures and transform faults as in oceanic islands along the Tuamoto ridge and the Clarion fracture zone, the geochemical theory is consistent with physical models. The products of extreme fractionation in volcanic islands such as the Tristan da Cunha group, Gough I. and the Marquesas, which are not related to either ridge axes or linear fractures, appear to be consistent with models. The Glomar Challenger is presently drilling in the Red Sea for further guides to the underlying geochemical processes.

E-10748
Hey, R.N. , Deffeyes, K.S., Johnson, G.L., Lowrie, A.
GALAPAGOS TRIPLE JUNCTION AND PLATE MOTIONS IN THE EAST PACIFIC. Nature, May 1972 237(5349), p.20-22, 14 refs.
Q1.N2

The possibility is considered that the Galapagos Rise (Cocos-Nazca Rise) which is known to be an active spreading feature from 83 W to 92 W might extend ten degrees to the west to form a triple junction with the East Pacific Rise. During a cruise of the USNS DeSteiguer in Apr. and May 1970 it became apparent that there was a three-ridge triple junction at 2N 102W, so the motion of the East Pacific Rise north (Pacific-Cocos Rise) of the junction is not the same as it is south (Pacific-Nazca Rise) of the junction. Determinations of the relative motions of the three rigid plates which meet at a triple junction make it possible to estimate the pole position for one plate if the motions of the other two are well determined. Thus by determining the Cocos-Nazca and Cocos-Pacific relative motions, Pacific-Nazca pole, which cannot be directly determined at present because of lack of data can be derived. The Pacific-Nazca pole can also be derived from the triple junction south of Easter Island and data on the Nazca-Antarctic boundaries. The Pacific-Nazca pole calculated from the two triple junctions should be the same if the plates behave rigidly. The Cocos-Nazca, Cocos-Pacific, Antarctic-Pacific and Nazca-Antarctic poles were determined directly from spreading rates and fracture zone azimuths.

E-10749
Solomon, M. , Griffiths, J.R.
TECTONIC EVOLUTION OF THE TASMAN OROGENIC ZONE, EASTERN AUSTRALIA. Nature physical science, May 1972 237(70), p.3-6, 11 refs.
Q1.N22

The Tasman Orogenic Zone (Geosyncline) is part of a large Palaeozoic tectonic belt along the Pacific margin. Fragments of the belt are recognized in New Zealand and Antarctica and their relationship to the Australian continent is shown in an early Mesozoic reconstruction. The early history (Cambrian-early Ordovician) of the Orogenic zone is best revealed in Antarctica and Tasmania and the later history (Ordovician-Permian) in New South Wales and southern Queensland. The geological evolution of these areas is discussed.

E-10750
Carter, R.M. , Landis, C.A.
CORRELATIVE OLIGOCENE UNCONFORMITIES IN SOUTHERN AUSTRALIA. Nature physical science, May 1972 237(70), p.12-13, 23 refs.
Q1.N22

Oligocene paraconformities occurring in shallow marine sequences throughout southern Australia, New Zealand, and the surrounding area (New Zealand Palteau) are described. It is suggested that these paraconformities represent an extended period of open sea erosion, winnowing, and sublevation. Their Oligocene age coincides with or immediately post-dates the time of separation of Australia from Antarctica, as inferred from paleomagnetic evidence. The effects of the circum-Antarctic current system on the sedimentation in these areas are considered. It is concluded that the Oligocene paraconformities occurring in southern Australia, New Zealand, and the New Zealand Plateau are of the same age and genesis and are best regarded as parts of a single regionally extensive surface, for which the name Marshall Paraconformity (Patrick Marshall, Professor of Geology at Otago Univ., 1908-1916) is proposed. It is expected that widespread paraconformities will afford a powerful stratigraphic check on patterns of plate movement inferred on geophysical grounds, prove useful as monitors of direction, strength and changes in ocean current regimes, and prove of value as reliable time indicative horizons.

E-10791
Wesson, P.S.
OBJECTIONS TO CONTINENTAL DRIFT AND PLATE TECTONICS. Journal of geology, March 1972 80(2), p. 185-197, 137 refs.
QE1.J8

Consideration of some of the problems of the continental drift hypothesis as formulated in its present aspect of plate tectonics leads to the conclusions that: (1) the continents have almost certainly not moved with respect to each other; (2) convection is not active throughout the whole mantle; (2) even if convection is active in the upper mantle it cannot account for drift; (4) pole positions derived from paleomagnetism, and results of this method of investigation in its global form generally, are afflicted with an unknown cause of error and are in any case too inexact for drift reconstructions. It is noted that the South Orkneys and South Georgia were omitted from the computer-fit reconstruction of the southern continents by Smith and Hallam (1970; L-8790) in order to improve the fit, and that the attempted Africa-Antarctica fit of Dietz and Sproll (1970; E-7650) results in the Antarctic Peninsula overlapping South Africa. The acceptance of the stability of continents means accepting also the fact that flora like "Glossopteris" were able to live in frigid zones such as the Antarctic. It is emphasized that this paper considers objections to drift only, except where prodrift data directly affect the antiargument: in these cases both sides of the matter are dealt with to avoid giving a wholly one-sided approach.

E-10793
Selby, M.J.
SLOPES AND THEIR DEVELOPMENT IN AN ICE-FREE, ARID AREA OF ANTARCTICA. Geografiska annaler, 1971 53A(3-4), p.235-245, 19 refs.
G25.G4

In the ice free valleys of southern Victorica Land Antarctica post-glacial

modification of valley walls has extended over the last 3.5 m.y., at least. There is no evidence of warmer or more humid conditions than exist at present and it is suggested that salt weathering processes in the inland areas and frost solifluction near the coast have produced bedrock (Richter) rectilinear slopes at a nearly constant angle of 35 deg. Slope recession has produced tent-like ridges which are the product of landform development in this type of frigid, arid, morphogenetic environment. It has not yet been determined what landforms replace the tent-like ridges in the evolutionary sequence. (Auth.)

E-10818
FOSSIL PLANTS AND ANIMALS. Antarctic, Dec. 1971 6(4), p.138
G845.A55

Fossil plants believed to be 200 m.y. old have been found in South Victoria Land by a Victoria University party. The plants are preserved as carbonized impressions in grey laminated siltstone and include fern fronds 8 in. long, bamboo-like steps up to 4 in. across, grass-like leaves, small seeds and a flower. They were found at Shapeless Mt., 100 mi west of Scott Base, on the edge of the Polar Plateau. Geologists in the party suggest that the fossils and the associated strata clearly show that this part of Antarctica once had a temperate climate similar to that of New Zealand today. For the first time in North Victoria Land a party flown to the Evans Neve, 350 mi north of Ross I discovered fossil specimens of brachipods and trilobites embedded in sandstone and limestone ridges. The Bowers group of these rocks was dated to the early part of the Paleozoic age, 300 to 500 million years ago.

E-10822
Grikurov, G.E. , Ravich, M.G., Solov'ev, D.S.
MAIN TECTONOGENETIC FEATURES OF ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.492-497. Translated from its Informatsionnyi biulleten' No.77, 1970. 15 refs.
Q115.S6862

A study is based on the view that the present-day structural plan of Antarctica was initiated by Baikalian tectonogenesis. The folded complexes, the Rossides, formed as a result of the consolidation of the Late Proterozoic-Early Paleozoic geosynclines, and the vast zones of the ancient crystalline basement, activated at the same time, produced a rigid structural framework that became particularly prominent in the body of the continent at the neotectonic stage when the regions, previously involved in the Baikalian tectonogenesis, experienced maximum uplift. Until the very end of the Baikalian tectonic epoch, the development of the major structures was uniform over the entire continent; it was only in the Late Paleozoic, when the northern part of West Antarctica became a part of the Pacific mobile belt, that the geosynclinal regime on the consolidated Baikalian folded basement was activated. As a result, the Epibaikalian Antarctic platform of the Gondwana type became partly fringed by Cimmerian folded Antarctandean structures. Some of the features of the latter are more easily understood if the Antarctandes are regarded not only as the folded framework of the Antarctic platform, but also as the south polar segment of the folded fringe of the Pacific thalassic craton.

E-10823
Znachko-IAvorskii, G.A.
NEOTECTONICS OF ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.498-500, Translated from its Informatsionnyi biulleten' No.77, 1970. 21 refs.
Q115.S6862

New relief data studied by Russian and non-Russian scientists are reported on the regional neotectonics of Antarctica, derived from a geomorphological analysis of its bedrock and glacial relief and the underwater relief of the continental slope of Antarctic seas. A 1:20,000,000 map of the neotectonic of Antarctica (including the continental slope) shows geostructural regions that differ in neotectonic movements and in relationship with ancient structural elements. Because stratigraphy of Cenozoic deposits is lacking, the beginning boundary of the neotectonic stage in Antarctica is not ascertained accurately; the stage is conditionally delimited by the Neogene-Quaternary. The different tectonic regime in various parts of the Gondwanian Antarctic platform in recent time produced its separation into two geostructural regions: a) plains not involved in mountain buildings; and b) regions of mountain building. Comparative analyses of the characteristics of the regions are given.

E-10825
Ioffe, L.I.
ABSOLUTE TEMPERATURES OF METAMORPHISM OF CALCAREOUS ROCKS OF THE GRANULITIC FACIES IN QUEEN MAUD LAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.503-507, Translated from its Informatsionnyi biulleten' No.77, 1970. 11 refs.
Q115.S6862

The results are given of petrographic and chemical analyses of four marble and calciphyre samples (obtained from the central part of Queen Maud Land), as well as of spectral, chemical, and X-ray analyses of their monomineral calcite fractions. Data show that the rocks were metamorphosed at various temperatures, at least 590 C for the progressive stage, which corresponds to the lower limit of the forsterite phase of metamorphism. Superimposed, lower-temperature processes in the marbles and calciphyres led to the formation of reaction interactions between the silicate and carbonate minerals and also to the decomposition of calcic dolomites and magnesian calcites. The regressive transformation of the rocks, revealed by the formation of diopside fringes around the forsterite grains, began at 565 C. Superimposed metamorphism, with which the development of phlogopite is probably associated, developed most extensively at 525-540 C.

E-10834
Zakharov, V.F.
THERMAL REGIME OF LAKE GLUBOKOYE (SCHIRMACHER PONDS). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.530-532, Translated from its Informatsionnyi biulleten' No.77, 1970
Q115.S6862

Data on vertical distribution and seasonal variations of water temperatures in Lake Glubokoye in 1966 are given. The variation of the heat content of the lake is attributed to the annual flow of water into the lake from adjacent higher situated bodies of water, which are full of ice in summer, hence are warmed. Simultaneous observations on the level and heat content of the lake show that heat advection by waters from the

neighboring bodies of water and melt waters, but not radiation are the cause of the increase in heat content in summer. Lake Glubokoye is one of a rare type of lake with permanent ice cover that is found only in Antarctica. It is characterized by a constant thermal inversion that increases with depth and as a result of the presence of a vertical water structure belonging to fresh water lakes that freeze only in the cold period of the year. The constant stable stratification of the surface waters favors a slight reduction in the heat content in winter caused by heat exchange at the water-bottom boundary of the lake. Cooling from the surface to the bottom does not occur because of heat advection by waters.

E-10845
Zamoruev, V.V.
PALEOGRAPHIC SIGNIFICANCE OF FINDINGS OF SEAL CARCASSES IN THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.567-577, Translated from its Informatsionnyi biulleten' No.78, 1970. 5 refs.
Q115.S6862

Two points of view on the significance of seal and penguin carcasses found far from shore and often at considerable elevations maintain: 1) Carcasses lie on ancient coastlines, uplifted by recent tectonic movements; and 2) The animals came themselves and, therefore, these finds cannot be used to determine the age of the newest uplifts. Observations on the Fildes Peninsula in the Bellingshausen Station area support the second point of view. The fact that live animals were seen travelling across the Fildes Peninsula, some with deep wounds, and the discovery of a carcass at the most 5-10 yrs old confirm the assumption that the appearance of seal carcasses on the terraces cannot be associated with the time of formation.

E-10846
Lopatin, B.G.
GEOLOGICAL INVESTIGATIONS DURING THE 1967-1969 U.S. ANTARCTIC EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.577-579, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862

As an exchange scientists, the author participated in field trips with the U.S. geological party working in the McMurdo Station area from Dec. 18, 1968 to Jan. 1969. According to program and depending on the time of the year and transport facilities, geologic investigations were carried out in three directions: 1) Reconnaissance survey of West Antarctica by the U.S. field party (in summer); 2) Detailed study of the basement rock of the Transantarctic Mts. in the McMurdo Hills (in the autumn-spring period); and 3) Study of volcanic rocks in the immediate vicinity of McMurdo Station (in winter). Geographic features and geological structure of the region, as well as the methods used for reconnaissance are described.

E-10869
Ayukawa, M. , Ashida, S., Ito, H.
MEASUREMENT OF GROUND RESISTANCE AT SYOWA STATION IN THE WINTER OF 1970. Antarctic record, Dec. 1971 No.42, p.43-52, In Japanese with English summary.

The rocket launching facilities were constructed at Showa Station, Antarctica, in Jan. 1970. For operating rocket launching with safety, ground maintenance is necessary even during the winter season. In order to investigate the seasonal variation of ground resistance, measurements of the earth-plate resistance and the ground temperature at 50cm were taken every ten days from Feb. 1970 to Feb. 1971. The ground resistance measured at three sites showed an increase with lowering of the ground temperature: the minimum being 8.4 ohm (at 0C) and the maximum 280.0 ohm (-14.5C) in the rocket ignition system; the minimum 5.4 ohm (1.0C) and the maximum 150.0 ohm (-12.0C) in the rocket radar-telemeter system; the minimum of 21.0 ohm (1.5C) and the maximum 390.0 ohm (-20.4C) in the radio station system.

E-10872
Yoshida, Y. , Yusa, Y., Moriwaki, K., Torii, T.
REPORT OF THE JAPANESE SUMMER PARTIES IN DRY VALLEYS, VICTORIA LAND IX. A PRELIMINARY REPORT OF THE GEOPHYSICAL STUDY OF DRY VALLEYS IN 1970-1971. Antarctic record, Dec. 1971 No.42, p.65-88, In Japanese with English summary. 2 refs.

A geophysical study of Lake Vanda was carried out by the Japanese party in the austral summer of 1970-71. Items, methods and instruments of the observations, and some results are briefly described. Items of the observations are as follows: (1) Change of lake level; (2) Vertical and horizontal distributions of water temperature and electric conductivity, and their seasonal changes; (3) Continuous measurement of water temperature at one station. (4) Thickness of lake ice and its change; (5) Temperature profile of lake ice and its change; (6) Temperature profiles of bottom sediments; (7) Evaporation from water surface and sublimation from ice surface; (8) Intensity of solar radiation under lake ice (measurement of ratio of solar radiation under lake ice to total incoming radiation); (9) Short period fluctuations of lake level seiche; (10) Water temperature of inflow from the Onyx River; (11) Vertical distribution of water temperature and electric conductivity in Lake Bonney; (12) Vertical distribution of dissolved oxygen, pH, alkalinity and hydrogen sulfide in the lake, and sampling of water for other chemical analysis; (13) Sampling of semifossilized algae; (14) Sampling of water from the Onyx River; (15) Sampling of bottom sediments; (16) Sampling of glacier ice; (17) Sounding of the lake; (18) Meteorological observations; and (19) Geomorphological survey.

E-10887
Jendrzejewski, J.P. , Zarillo, G.A.
LATE PLEISTOCENE PALEOTEMPERATURE OSCILLATIONS DEFINED BY SILICOFLAGELLATE CHANGES IN A SUBANTARCTIC DEEP-SEA CORE. Deep-sea research, Apr. 1972 19(4), p.327-329, 8 refs.
GC1.D25

Paleotemperature oscillations have been examined in a late Pleistocene subantarctic core (E 33-22) using silicoflagellates and planktonic foraminifera. A paleotemperature record of 450,000 years is inferred. High frequency peaks of the silicoflagellate genus Dictyocha alternate with intervals made up almost exclusively of the genus Distephanus and lacking Dictyocha. Dictyocha peaks closely correspond with peaks of warm-water foraminifera, and intervals of Distephanus correspond with cooler planktonic foraminiferal assemblages. Silicoflagellate, foraminiferal and calcareous nanno-fossil trends correspond in most cases, although two important discrepancies occur. The potential of the silicoflagellates as Pleistocene paleotemperature indicators has been shown.

E-10494
Martin, V.I.
PALEOGLACICLCGICAL STUDIES IN QUEEN MAUD LAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.391-394, Translated from its Informatsionnyi biulleten' No.75, 1969. 6 refs.
Q115.S6862

Detailed studies were made of the moraines on the slope of the Insel Mt. in central Queen Maud Land by a field party of the 12th Soviet Antarctic Expedition in 1967. Morpholcgical and lithological features of the area used for the age classification of the moraines are discussed. Data indicate the rhythmic variations in volume, dimensions and other characteristics of the Antarctic ice sheet, which can be represented by a sine curve with its peaks (glaciation maxima) decreasing toward the present time.

E-10909
Voronov, P.S.
ADAMS ISLET OFF ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.432-433, Translated from its Informatsionnyi biulleten' No.75, 1969.
Q115.S6862

Briefly described is the morphology and petrology of Adams I., near Mirnyy Station, discovered and mapped by the Mawson Expedition on Nov. 25, 1912 and visited by the author on Nov. 11, 1956. The island was named in honor of the boatswain of the expedition's ship Aurora.

E-10933
Katz, H.R.
PLATE TECTCNICS AND OROGENIC BELTS IN THE SOUTHEAST PACIFIC. Nature, June 9, 1972 237(5354), p.331-332, 54 refs.
Q1.N2

Previous studies have been consistent with the view that the South American Andes and Antarctic Peninsula orogens have a common history since at least the Late Palaeozoic, and are to be regarded as parts of an originally continuous and rectilinear cordillera that was subsequently bent and disrupted to form the Scotia Arc. Drift reconstructions show this proto-cordillera bordering the Pacific margin as an uninterrupted orogenic belt throughout the Mesozoic and Early Cainozoic. Comparison of tectonic setting and framework, sedimentary and orogenic history and structure, together with a plate tectonic interpretation, however, shows that the orogenic belts of southernmost South America and Antarctic Peninsula are not related to each other. Thus, the term "Antarctandes" is not justified and is misleading. As a corollary the problem of the Scotia Arc is not limited to two alternatives (oroclinal bending and disruption of an originally straight orogenic belt, or constitution of the arc as a primary feature); the Scotia Arc may be a composite feature with limbs of different origin and partial bending only.

E-10947
Gunner, J. , Bowman, J.R., Faure, G.
ISOTOPE GEOCHEMISTRY OF STRONTIUM AND GEOCHRONOLOGY IN THE TRANSACTARCTIC MOUNTAINS. Ohio. State University, Columbus. Laboratory for Isotope Geology and Geochemistry. Report, Jan. 1972 No.6, 102p., 46 refs. Excerpts of theses.

This is the fourth annual progress report prepared for the National Science Foundation which has supported research on the geochronology and geochemistry of rocks from Antarctica in this laboratory since 1967. The results reported here are preliminary in nature and deal with the Hope and Ida Granites of the Beardmore Glacier Region and Mesozoic basalts at Storm Peak and the Kiwan Escarpment. For abstracts of the three papers comprising the report see E-10948 to 10950.

E-10948
Gunner, J.
AGE AND ORIGIN OF THE HOPE AND IDA GRANITES, BEARDMORE GLACIER REGION, ANTARCTICA. Ohio. State University, Columbus. Laboratory for Isotope Geology and Geochemistry. Report, Jan. 1972 No.6, p.1-26, 10 refs. Excerpt of thesis.

Two major hypotheses are tested: (1) Hope and Ida Granite intrusions in the Beardmore Glacier region have a common magmatic origin; and (2) Individual Hope Granite intrusions were derived by melting of rocks similar to those which now surround them. The isotopic and chemical data suggest the following conclusions. The Hope and Ida Granites of Area B (Shackleton Coast) are comagmatic. The magmas from which the plutons in Areas A (Miller Range) and B were derived crystallized at about the same time (475 m.y. ago) but had significantly different 87Sr/86Sr ratios. The magma in Area A could have been generated by nearly total melting of material chemically similar to the Nimrod Group under relatively dry conditions (of the order of 500 bars water vapor pressure). The parent magma of the Hope and Ida Granites in Area B could have been generated by a moderate degree of melting of material chemically similar to the Goldie Formation under relatively high water vapor pressures (4000 bars or more). The Nimrod Group was melted under drier conditions than the Goldie Formation.

E-10949
Gunner, J.
MAGMATIC DEVELOPMENT OF THE HOPE AND IDA GRANITES, BEARDMORE GLACIER REGION, ANTARCTICA. Ohio. State University, Columbus. Laboratory for Isotope Geology and Geochemistry. Report, Jan. 1972 No.6, p.27-68, 9 refs. Excerpt of thesis.

The results of geochemical and petrographic analyses of rocks from the Beardmore Glacier area show the magmatic origin of the Hope and Ida Granites. K-feldspar samples from both rock units fit a single set of simple patterns on variation diagrams of K/Rb, Ba/Rb, Ba/Sr, Rb/Sr. The chemical variations in the K-feldspars and plagioclases and the modal variations in the rocks are best explained in terms of magmatic differentiation. A closely-spaced sequence of three intrusions of Hope Granite, followed by the Mt. Ida pluton and the pegmatite and aplite dikes, is suggested. Geochemical and petrographic comparisons with the Mt. Hope pluton suggest that the Hope Granite intrustions at Wise Bay, Threshold Nunatak, Sirohi Point and the East Beardmore pluton crystallized from magmas which were at similar stages of differentiation to that of the Mt. Hope pluton.

E-10950
Bowman, J.R.
INITIAL 87SR/86SR RATIOS AND SILICA CONTENT OF MESOZOIC BASALT FROM ANTARCTICA. Ohio. State University, Columbus. Laboratory for Isotope Geology and Geochemistry. Report, Jan. 1972

No.6, p.69-102, 27 refs. Excerpt of thesis.

Thirteen samples of tholeiitic basalt rocks from Kirwan Escarpment in western Queen Maud Land and ten samples of tholeiitic basalt (Kirkpatrick Basalt) from Storm Peak in the Queen Alexandra Range of the Central Transarctic Mountains were analyzed for Rb, Sr, and SiO2 concentrations, the Rb/Sr ratio, and for the isotopic composition of Sr. Rb and Sr concentrations were measured by X-ray fluorescence spectrometry. The results show that the Storm Peak basalts are characterized by unusually high SiO2, Rb, and K2O contents, low MgO, CaO, and Sr contents, abnormally high initial 87Sr/86Sr and Rb/Sr ratios, and low K/Rb ratios. These values are completely atypical of normal basaltic rocks. In contrast, the basalts at the Kirwan Escarpment are characterized by initial 87Sr/86Sr ratios and Rb, Sr, and SiO2 concentration values more typical of normal continental tholeiites. Additional details are given on correlation of the strontium ratios, crystallization, and chemical discontinuities.

E-10951
CAUSES OF GLACIATION. Prichinite za zalediavaneto. Priroda (Sofia), Jan.-Feb. 1972 21(1), p.77, In Bulgarian.
Q4.P78

Hypotheses suggested by A.T. Wilson and G.H. Denton on the causes of glaciation are mentioned and the possible effect of Antarctic ice cover "tides" on sea level, sea-ice distribution, and atmospheric temperature during the Quaternary is briefly discussed.

E-10956
Ravich, M.G.
CRYSTALLINE BASEMENT OF THE ANTARCTIC PLATFORM. Antarctic (Antarktika), 1971, p.31-59, TT 67-59072. Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966.

Antarctica is composed of an ancient platform of 12 million sq km which is partially bordered on the Pacific coast by Paleozoic-Mesozoic folded structures. The large part of the platform is characterized by a pre-Riphean crystalline basement, 15-20 km thick, which is overlain by patches of Riphean-Lower Paleozoic sedimentary-volcanogenic formations of the platform mantle. Basic crystalline schists and acidic and high-alumina plagiogneisses are the predominating rocks in the basement. Marbles and calciphyres are often associated with the latter. The Antarctic platform is the world's largest province of deeply metamorphosed and ultrametamorphosed rocks. The large exposed areas of the crystalline basement are the result of deep erosion of fault-block mountain massifs which were uplifted in the Cenozoic. The following aspects of the crystalline basement are discussed in detail: regional metamorphism, ultrametamorphism, tectonic structures, diaphthoresis, the charnockite complex, platform intrusions, and absolute ages. (For Russian original see E-5040)

E-10968
Kamenev, E.N., Klimov, L.V., Shuliatin, O.G.
GEOLOGICAL STRUCTURE OF ENDERBY LAND AND THE PRINCE OLAV COAST. Antarctic (Antarktika), 1971, p.1-33, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 10 refs.

The western part of Enderby Land and Prince Olav Coast is mostly ice-covered, while in the eastern part mountains crop out 50-300 m above the ice, the largest ranges lying in long ridges. Three series of metamorphic rocks, evidently formed during the Lower Paleozoic from Precambrian sediments and volcanic rocks, are distinguished in the central and eastern zones: Haggatt, Condon, and Nye. Partially ultrametamorphosed dikes of ultrabasic and basic rocks cut migmatized and granitized crystalline schists and plagiogneisses, and are in turn cut by granite and pegmatite veins, which may represent two periods of metamorphism before this crystalline foundation was consolidated. Dolerite dikes, probably Mesozoic, are the youngest intrusive bodies found in Enderby Land; they were intruded when the crystalline foundation underwent intense disjunctive tectonic movements, resulting in faults and zones of cataclasis and mylonization. Two charnockite massifs are considered to be rheomorphic formations intruded after regional metamorphism and migmatization, and connected with a period of ultrametamorphism. For Russian original see E-4539.

E-10969
Solov'ev, D.S.
NEPHELINE SYENITE INTRUSIVES OF QUEEN MAUD LAND. Antarctic (Antarktika), 1971, p.35-81, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 3 refs.

A nepheline syenite intrusion was discovered in Queen Maud Land (at about 72 deg S and 0 deg) during the 5th and 6th Soviet Antarctic Expeditions. The body is 8 by 3 km and mostly buried beneath the ice; its age, determined by the argon method, is 170-200 m.y. Similar intrusions occur on other continents, where they are likewise confined to zones of deep regional faults near the contact of the crystalline basement and the sedimentary-volcanic cover. The intrusion is relatively uniform in mineral composition but varies in texture and structure. Trachytoid syenites, located in the areas nearest the contact surface, are characterized by large, oriented orthoclase crystals; the orthoclase crystals near the center of the intrusion are larger and non-oriented. The mineral composition, crystallochemical formula, chemical composition, specific gravity, and refractive index are given for samples from 5 locations. The physical appearance of each mineral sample is described, and formation conditions are inferred. Contact minerals and those of veins associated with the main intrusive body are described in detail. For Russian original see E-4540.

E-10971
Bardin, V.I., Markov, K.K.
PROBLEM OF PENEPLANATION IN ANTARCTICA. Antarctic (Antarktika), 1971, p.95-104, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 18 refs.

Descriptions of various leveled rock surfaces found in Antarctica are compiled, and their geneses are discussed. Peneplained peaks with elevations ranging from 500 to 3700 m are found in the Prince Charles Mountains, Queen Maud Land, the northern Antarctic Peninsula, the Shackleton Range, Marie Byrd Land, and the Neptune Range. Leveled surfaces are also found on nunataks and other prominences at lower elevations in coastal outcrops at Bunger Hills, Mawson Station, Schirmacher Ponds, and Sandefjord Ice Bay. The age of the peneplain in Victoria Land is found to be pre-Beacon; near Beaver Lake in the Prince Charles Mountains, the surface lies beneath the Permian Amery Series. The peneplain has probably been created through water denudation by the end of the Mesozoic; the present differences in its elevation are due

possibly to Neogenic faulting. That Quaternary glacial processes account for part of the peneplanation is indicated by glacial striae and polishing of leveled rock now cropping out far above the ice-cap. For Russian original see E-4542.

E-10979
Ravich, M.G. , Klimov, L.V., Solov'ev, D.S.
REMARKS ON P.S. VORONOV'S ARTICLE ENTITLED "TECTONICS AND NEOTECTONICS OF ANTARCTICA". Antarctic (Antarktika), 1971, p.213-220, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 7 refs.

A critique is presented of the article published in Antarktika: Doklady Komissii 1963 (publ. 1964) and also in "Antarctic Geology," (E-2660, E-667). In his structural diagram, Voronov has reduced the Antarctic platform to a small sector in the central part of East Antarctica, which he terms the area of the "outcrop of the Antarctic craton basement not subjected to the early Paleozoic rejuvenation," and which is bordered by areas with "supposed partial development of older Caledonian tectogenesis." Various objections are raised regarding this representation, among them Voronov's failure to define his concepts and maintain consistency, his misuse of absolute age determinations and seismic data from the literature, and his careless extrapolation for areas not yet investigated. A Precambrian platform structure has definitely been established in a part of Queen Maud Land which Voronov has included in his zone of older Caledonian folding. The greenschists of East Antarctica, which Voronov considers to be further proof, may have been formed under a variety of conditions other than Caledonian folding. His inclusion of all of West Antarctica in an Alpine fold zone is unfounded, for evidence of post-Caledonian folding there is only known in the Antarctic Peninsula and the Ellsworth Mountains. For Russian original see E-4550.

E-10996
MAJOR FOSSIL FIND IN VICTORIA LAND. Antarctic, Mar. 1972 6(5), p.148-150
G845.A55

A major fossil discovery was made in the Evans Neve area of Northern Victoria Land, where no marine fossils have been found before, by a geological party from the 16th expedition sent south by the Victoria University of Wellington. Another party, working in the Boomerang Range, about 150 mi west of Scott Base, dug out of Shapeless Mountain probably the most varied collection of fossil plants yet found in the Transantarctic Mountains. The most important fossils found by the Evans Neve party were brachipods and trilobites. They were discovered on a bluff of the north side of the Mariner Glacier 8 to 10 mi southwest of Mount McCarthy in the Bowers Group rock sequence, which is estimated to be Late Cambrian (about 500 million years ago). The fossils are the youngest so far described from the Transantarctic Mountains. Also discovered were Bowers Group rocks in the northern part of the Evans Neve, lying far to the west of previously known occurrences, and a coal bed nearly 23 ft thick in the Beacon sequence, at nearby Mount Fleming.

E-11017
Quilty, P.G.
MIDDLE JURASSIC BRACHIOPODS FROM ELLSWORTH LAND, ANTARCTICA. New Zealand journal of geology and geophysics, Mar. 1972 15(1), p.140-147, 12 refs.
QE1.N55

Flabellirhynchia australensis n.sp. is described from two localities in eastern Ellsworth Land, Antarctica. At one locality it is associated with Middle Bajocian ammonites. Its position in Flabellirhynchia is based on comparison with F. concinna Crickmay. Another rhynchonellid, closely allied to Rhactorhynchia or Cymatorhynchia, is also recorded.

E-11018
Webb, P.
COMMENTS ON THE REPORTED OCCURRENCE OF GLOBOTRUNCANA CONTUSA (CUSHMAN) FROM THE UPPER CRETACEOUS OF JAMES ROSS ISLAND, GRAHAM LAND. New Zealand journal of geology and geophysics, Mar. 1972 15(1), p.183, 3 refs.
QE1.N55

Examination of the specimen reported by Macfadyen (1966; E-4458) to be ?Globotruncana contusa (Cushman) from the lower-middle Campanian of James Ross I. indicates that it belongs to the agglutinated family Ataxophragmiidae and should be referred to either Dorothia or Marsonella. This generic revision removes an anomalous occurrence of Globotruncana contusa in Campanian sediments.

E-11019
Wilson, G.J.
AGE OF THE GARDEN COVE FORMATION, CAMPBELL ISLAND. New Zealand journal of geology and geophysics, Mar. 1972 15(1), p.184-185, 3 refs.
QE1.N55

In 1967 twelve species of dinoflagellate cysts and acritarchs from a siltstone sample collected from the Garden Cove Formation, Campbell Island were described. On the basis of polynological evidence it was concluded that the sample was Teurian (Danian) in age despite the presence of some Cretaceous elements. The age agreed with that indicated by the foraminifer, Gaudryina whangaia Finlay, a Teurian index species recorded several years earlier from the same formation. Current research suggests the probability that the dinoflagellate assemblage from the Garden Cove Formation is Haumurian (Maastrichtian) in age and none of the taxa reported by Wilson (1967;E-5563) can now be regarded as "typically Tertiary". The absence of characteristic pre-Maastrichtian genera, especially those known to be abundant in the Upper Campanian, and presence of species unknown below the Maastrichtian preclude the possibility of a pre-Haumurian age.

E-11022
Laird, M.G. , Andrews, P.B., Kyle, P., Jennings, P.
LATE CAMBRIAN FOSSILS AND THE AGE OF THE ROSS OROGENY, ANTARCTICA. Nature, July 7, 1972 238(5358), p.34-36, 13 refs.
Q1.N2

The discovery of late Cambrian body fossils in the upper part of the Ross Orogeny establishes, for the first time, a definite minimum age for the succession and enables correlation with early Phanerozoic sequences elsewhere in Antarctica. The fossils, chiefly brachiopods and trilobites, occur in the southernmost known outcrops of the Bowers Group, a largely clastic sequence, where it flanks the eastern side of the Evans Neve. The sequence consists of fissile mudstone in the lower half, grading upwards into sandstone, with localized limestone lenses in mudstone and sandstone. The fossil discovery provides evidence that a

Cambrian geosyncline or series of geosynclines existed along the whole of the present extent of the Transantarctic Mountains, 3,000 km. It also provides palaeontologic evidence for the maximum age of the Ross Orogeny, which folded the lower Palaeozoic and late Precambrian strata. The orogeny was accompained and followed by widespread intrusion of granite belonging to the Granite Harbour Intrusive Group. In Victoria Land radiometric dating of these granites gives ages between 400 and 530 m.y. The maximum ages agree well with the palaeontological data, and it seems that the initiation of the Ross Orogeny must have coincided with or closely followed the deposition of the fossiliferous sediments in the Evans Neve area.

E-11037
Veevers, J.J.
PHANEROZOIC HISTORY OF WESTERN AUSTRALIA RELATED TO CONTINENTAL DRIFT. Geological Society of Australia. Journal, July 1971 18(2), p.87-96, 54 refs.
QE340.G413

From north to south, the sedimentary basins of Western Australia change from broad platforms of wholly marine strata that span the entire Phanerozoic (Bonaparte Gulf and Canning Basins) through the intermediate Carnarvon Basin to rifts of nonmarine Permian and Mesozoic strata (Perth basin). These contrasts in age, facies, and structure reflect different positions of the basins in Gondwanaland: the Bonaparte Gulf and Canning Basins have lain at the continental margin facing an open ocean during the entire Phanerozoic, whereas the Perth Basin lay in the interior of Gondwanaland until India and Australia moved apart in the Cretaceous. The Eucla basin came about by events connected with the dispersal of Antarctica and Australia in the Eocene. The northwest part of the Australian Block (Timor and the Timor Sea) was deformed in the Miocene when Australia collided with southeast Asia.

E-11038
Williams, P.F. , Hobbs, B.E., Vernon, R.H., Anderson, D.E.
STRUCTURAL AND METAMORPHIC GEOLOGY OF BASEMENT ROCKS IN THE MCMURDO SOUND AREA, ANTARCTICA. Geological Society of Australia. Journal, July 1971 18(2), p.127-142, 20 refs.
QE340.G413

The petrography and structure of three small areas, the Nussbaum Riegel and the north and south sides of the Garwood Valley in the "Dry Valleys" region of Victoria Land, Antarctica, are described and discussed. The rocks are mostly pure or impure marbles plus lesser quantities of amphibolite, schist and quartz-feldspar rocks, and mineral assemblages indicate that they have been metamorphosed under conditions of the amphibolite facies, and possibly, locally under conditions transitional to the granulite facies. In general they have not suffered retrograde metamorphism. Nussbaum Riegel is characterized by isoclinal folds and very well-developed boudinage structure. Examination of the boudins reveals that the competent beds behaved in a ductile manner when failing parallel to the fold axis and in a brittle manner when failing perpendicular to the fold axis. An explanation for this observation is offered, based on variation in strain rate in various directions during the development of the fold. The Garwood Valley areas are complex and two generations of folds are recognized. The large scale structure of the south side of the Garwood Valley is interpreted as a tight basin resulting from the interference of the two generations of folds. The large scale structure of the north side of the Garwood Valley is believed to be similar in style to that of the south side; but insufficient data are obtainable to allow detailed interpretation.

E-11057
McKenzie, D.P.
PLATE TECTONICS AND SEA-FLOOR SPREADING. American scientist, July-Aug. 1972 60(4), p.425-435, 17 refs.
LJ85.S502

The motions of the continents and the evolution of the ocean basins have been described from seismic data on a global scale and from the earth's magnetic data at the sea surface. The theory of plate tectonics applied to these actions is constructed in terms of the relative motion between two plates, resulting in ridges, trenches, and transform faults. Since ridges are long linear features the effect of the reversal of the earth's main magnetic field is to magnetize the sea floor in long linear strips of normal and reverse polarity, the ridges, in effect, recording the magnetic anomalies. The evolution of the continents is closely connected to that of trenches, because vulcanism in the island arcs behind trenches produces rocks similar to those out of which the continents are built. One important consequence of the geometric--or kinematic--theory is the realization that little is known about the dynamics of plate motion. What was once believed to be a consequence of convection within the mantle is now seen to be a consequence of the creation, motion, and destruction of plates, both aspects to be considered in any dynamic theory. Plate motions, and destruction of deep earthquakes, magnetic lineations and anomalies, creation of sea floors, and fluid convection are illustrated and discussed.

E-11071
Dalziel, I.W.D.
K-AR DATING OF ROCKS FROM ELEPHANT ISLAND, SOUTH SCOTIA RIDGE. Geological Society of America bulletin, June 1972 83(6), Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1798, p.1887-1894, 26 refs.
QE1.G2

K-Ar whole-rock ages ranging from 78 to 88 m.y. have been determined from four samples of quartz-calcite-amphibole schist obtained from Elephant Is. in the South Shetland Is. group on the southern limb of the Scotia Arc. The lithology and structural history of the rocks forming Elephant Is. indicate that they are part of the pre-Late Jurassic, and probably Paleozoic, metamorphic rocks of the region. The ages are likely to reflect a regional thermal event in the Antarctandes during the late Mesozoic-early Cenozoic Andean orogeny.

E-11078
Fourcade, N. , Viramonte, J.G.
PRESENT SITUATION OF VOLCANIC ACTIVITY IN DECEPTION ISLAND, SOUTH SHETLAND ISLANDS, ANTARCTICA. Cambridge, Smithsonian Institution Center for Short-lived Phenomena, May 1972, 8p., 5 refs.

Most of the volcanic activity in Deception I. is located along the fissure opened in 1969, especially in the vents near the Chilean Station. Many high temperature fumaroles were observed along collapse fissures of 280 deg trend. Fumaroles present a hydrochloric character and vary in temperature from 178 to over 350 deg C.

A curious phenomenon consisted of periodic little explosions throwing small fragments of rocks 20 [illegible] high. A great amount of dead krill was found in the vicinity of thermal submarine zones, possibly due to the effect of hot water of fumarolic gases. Penguins showing ulcerous wounds of the feet have been observed. Weekly checking of the vents showed the crater to be in a permanent state of collapse, with low temperature fumarolic activity, hot springs, and hot soils at points in the collapse ring. The findings clearly demonstrate the possibilities of new eruptions in the near future.

E-11099
Romer, A.S.
SOUTH AMERICAN FOSSIL REPTILES AS EVIDENCE OF GONDWANALAND. Australian natural history, June 1972, 17(6), p.206-212.
QH1.A986

Large numbers of fossil reptiles (skulls and skeletal materials) recently found in regions of Ischigualasto and Chanares, Argentina and previous evidence from oceanography, geophysics, ancient glaciers, and flora support the belief that Gondwanaland existed in the Triassic period and included in its make-up Antarctica, South America, Africa, and Australia. Data reveals that animals of the Triassic period living in South America were generically identical to those in South Africa and probably similar to those in Antarctica, India, and Australia. Other investigations reveal that Triassic faunas have been found in India similar to those of Africa; that Australian examples of Triassic amphibians have been known, but until lately, almost nothing about Triassic reptiles; and that recent fossil pockets in the Rewan Formation of the early Triassic have been found in Queensland with amphibian and reptile remains. Within the last two years discoveries in Antarctica have shown the presence of Triassic reptiles exceedingly similar to those of Africa.

E-11107
Verwoerd, W.J.
GEOLOGY. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.49-62, 83 refs.
QH199.5.S68

The geomorphology, bathymetry, volcanology, structure and glacial geology of the two islands are described. They have many features in common and are thought to represent the summits of coalescing shield volcanoes arising from the flank of the Mid-ocean Ridge. Throughout their history alternating explosive and effusive eruptions appear to have taken place from numerous separate vents. Two stages of volcanic activity, an intervening period of glaciation, and tectonic adjustments leading to radial fracturing of Marion I. have been recognized. The lavas are all alkali basalts and trachybasalts belonging to a typical Atlantic suite. During the first stage the order of extrusion appears to have been inverse. The second stage lavas exhibit all the characteristic features of aa and pahoehoe flows. Scoria cones were built up over the vents and a few tuff cones were formed near sea level. The effects of minor sea level changes were probably masked by isostatic effects resulting from the loading of the crust.

E-11109
McDougall, I.
GEOCHRONOLOGY. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.72-77, 11 refs.
QH199.5.S68

Potassium-argon dates on lavas from Marion and Prince Edward Is. show that the volcanic activity producing the grey lavas occurred between 276,000 p/m 30,000 years ago and 100,000 years ago or slightly younger. The younger black lava sequence was erupted about 15,000 p/m 8,000 years ago. The results are consistent with the geology and confirm that the grey and black lava series on both islands are equivalent. No unequivocal evidence is found for the presence of excess radiogenic argon in any of the lavas.

E-11110
Kable, E.J.D., Erlank, A.J., Cherry, E.D.
GEOCHEMICAL FEATURES OF LAVAS. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.78-88, 36 refs.
QH199.5.S68

K, Rb, Ba, Sr, Zr, Nb, Y, Th, U, Ni and Zn have been determined in both the older and younger basalts and trachybasalts of Marion and Prince Edward Is. General elemental variations (with the exception of Ni, which is effected by the fractional crystallisation of olivine) are small, and show that these lavas have not been greatly differentiated. High U/K ratios distinguish the younger Marion lavas from their older counterparts, while younger lavas of Prince Edward are enriched in Sr relative to the older series. The K/Ba, Ba/Zr and Zr/Nb ratios and the Zn contents show clearly that there are characteristic differences between the two islands. It is concluded that while these lavas have not been greatly affected by fractionation processes, subtle but distinct fractionation has occurred in the magmas from which the lavas of each island were derived. This conclusion imposes restrictions upon the supposition that the two islands are twin peaks of the same volcano. Comparison of the analyses with those from other oceanic islands indicates that the Marion and Prince Edward lavas have strong affinities with other oceanic alkali basalts.

E-11171
Fourcade, N.H.
DECEPTION ISLAND: THE VOLCANIC ISLAND. Decepción: la isla volcan. Antartida, Dec, 1971 No.1, p.44-48. In Spanish.

The development of Deception Island shows its formation in recent geological times by submarine volcanic eruptions, the remains of which were covered by more recent activity. The nature of a new period initiated during the eruptions of December 1967 and past periods of the island's history are examined. The research program of the Instituto Antartico Argentino, in light of the current volcanic activity on the island, includes the study of lava from various periods by petrological, chemical, and other means to determine magmatic origins. Photographs of lava formations are included.

E-11179
Barrett, P.J.
LATE PALEOZOIC GLACIAL VALLEY AT ALLIGATOR PEAK, SOUTHERN VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, June 1972 15(2), p.262-268, 10 refs.
QE1.N55

A north-east trending Paleozoic glacial

valley has been cut in Devonian Aztec Siltstone at Alligator Peak, southern Victoria Land. The valley, which is exposed in a north-west-south-east cross-section, has walls as steep as 50 deg, and is filled to a depth of 80 m with glacial and fluvial sediments of the Metschel Tillite (Permian-Carboniferous (?)). The oldest fill is complexly folded and comprises locally brecciated glacial and fluvioglacial sandstone, conglomerate, and claystone. This is overlain by fluvial sandstone, and the fill is completed by a lacustrine siltstone lens. Strikes of fold axes and other linear features in the valley trend north-east, subparallel to the strike of the valley wall, indicating that the oldest fill was deposited by slumping of the valley wall and not by "ice sheve" along the length of the valley.

E-11191
Zinderen Bakker, E.M. van, Sr.
GLACIATION OF MARION ISLAND. South African journal of antarctic research, 1971 No.1, p.35, 2 refs.

The present-day topography of the volcanic island Marion clearly indicates that it was covered by glaciers at some stage during its history. According to potassium-argon dates the island is of middle to late Pleistocene age and geological surveys have shown that the surface of the older grey lava has been smoothed by glacial action which also left behind typical striated platforms, while the younger black lava flows are of post-glacial age. This result shows that Marion I. was covered by glaciers at the same time that the Wurm-Wisconsin-Valdai glaciation occurred in the northern hemisphere and when the Kenya glaciation spread over the highest mountains of East Africa. Good proof for the final stages of this glaciation on Marion I. has been provided by analytical investigations of pollen which have shown that between about 16000 and 14000 years B.P. the climate of the island near sea level must have been colder than at present. Correlation of the glaciation data of Marion I. with present and future research on oceanic sediments in the surrounding sea and also with the glacial history of the Antarctic continent is recommended.

E-11211
Wright, J.B.
CONTRIBUTIONS TO THE VOLCANIC SUCCESSION AND PETROLOGY OF THE AUCKLAND ISLANDS, NEW ZEALAND. V. CHEMICAL ANALYSES FROM UPPER PARTS OF THE ROSS VOLCANO, INCLUDING THE MINOR INTRUSIONS. Royal Society of New Zealand. Journal, Aug. 1971 1(2), p.175-183, 9 refs.
Q1.R7

Twelve new analyses confirm that the bulk of exposed lavas forming the upper two-thirds of the Ross volcano are largely undifferentiated mildly alkaline olivine basalts. Twelve analyses (11 new) from minor intrusive bodies, ranging from picritic to trachytic in composition, show that the last phase of activity in the Ross volcano was characterized by more alkaline and undersaturated magmas than those preceding it. Three conveniently distinguishable magma batches contributed to the growth of this volcano, as at present known: the first, forming about the lower third of the exposed succession, was a strongly fractionated series, from alkaline olivine basalt to soda-rhyolite, with intermediate types well represented; the second batch erupted alkaline olivine basalts to build a virtually undifferentiated lava pile forming the main bulk of the volcano; and the third, represented only by minor intrusives, was again a differentiated series (olivine basalt to trachyte), but more undersaturated and without intermediate members. The Auckland Is. volcanoes are of oceanic type, but are of special interest because, like the other subantarctic islands of New Zealand, they rise from the submerged part of the New Zealand Plateau.

E-11220
Knain, V.E.
EVOLUTION OF THE TECTONOSPHERE AS REFLECTED IN THE EARTH'S PLANETARY RELIEF. Planetarnyi rel'ef Zemli kak otrazhenie evoliutsii tektonosfery. Geomorfologiia, Oct.-Dec. 1971 No.4, p.3-8, In Russian with Eglish summary. 12 refs.

Beginning of the geomorphological development of the Earth is associated with the beginning of the Neogene (1400 m.y. ago). Suggested are four stages of planetary morphogenesis: the Late Proterozoic, Paleozoic and Early Mesozoic, Late Mesozoic - Early Paleogene, and Oligocene-Quaternary (Neotectonic). The break-up of Gondwanaland and Laurasia in the Late Mesozoic resulted in the formation of basins of the Atlantic, Indian, Southern and Artic Oceans. The boundaries of present continents and oceans were defined at that time and an asymmetry developed between Arctic and Antarctic.

E-11224
Gonzalez Ferran, O.
VOLCANIC RANGES OF MARIE BYRD LAND. Cadenas volcanicas de la Tierra Marie Byrd. Instituto Antártico Chileno. Boletín, 1969 No.4, p.19-23, In Spanish.

The mountains lying between 74 - 78S and 100 - 140W have a 95 percent volcanic structure. Dating from the Cenozoic, they reach 4,200m in height and include at least 26 major volcanoes with well preserved craters. Above 76 deg., the mountains are characterized by andesitic and olivinic basalt. South of 76 picritic basalt predominated. This area, Marie Byrd Land, was the scene of intense volcanic activity at the end of the Tertiary. More recent activity occurred west of the Ames Range, in an area with a pyroclastic character. Small lava flows are still observed there. The Berlin volcanoes were active within the historical era: the ice is covered with pumice and is deformed. Photos and a table of Marie Byrd Land volcano dimensions are included.

E-11225
Munizaga, F.
GOECHRONOLOGY IN WESTERN ANTARCTICA. Geocronologia en la Antartica occidental. Instituto Antártico Chileno. Boletín, 1969 No.4, p.24-25, In Spanish.

During the 1968-1969 summer, the National Science Foundation made an expedition through the area bounded by 71-74S and 95-105W. Forty-eight rock samples were collected for geochronological and petrological examination. Quartziferous monzonite predominated with numerous outcroppings of other rocks interspersed. Rubidium-strontium dating of these samples is now being undertaken. Establishing the ages of these rocks will permit them to be correlated with the rest of western Antarctic geology and with Andean geology, a goal of importance in the theory of continental origins.

E-11226
Covacevich C., V. , Lamperein B., C.

NOTE ON THE DISCOVERY OF FOSSIL PRINTS OF BIRDS IN FILDES PENINSULA, KING GEORGE ISLAND, SOUTH SHETLAND ISLANDS, ANTARCTICA. Nota sobre el hallazgo de improntas fosiles de aves en Peninsula Fildes, Isla Rey Jorge, Shetland del Sur, Antartica. Instituto Antartico Chileno. Boletin, 1969 No.4, p.26-28, In Spanish.

During geological studies of King George Island, Fildes Peninsula (1968), Chilean scientists discovered fossil aves. Leaf fossils from the Tertiary were found in an area of andesite, basalt, and sedimentary rock. In an area possibly contemporary to this, bird prints were located. The tracks were of four separated toes, 3 pointing to the rear and 1 forward, without interdigital membrane. All toes were on the same plane. The bird is presumed to have stood about 15cm tall. This discovery radically alters the date on the existence of vertebrates in Antarctica and is the first fossil indication of this type of bird in Fildes Peninsula. A photograph of the bird prints is given.

E-11292
Varne, R. , Rubenach, M.J.
GEOLOGY OF MACQUARIE ISLAND AND ITS RELATIONSHIP TO OCEANIC CRUST. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.251-266, 32 refs.

GEOL, ASR

Macquarie I. is formed of fault-bounded blocks from different crustal levels. The northern part of the island is composed of gabbro and serpentinized peridotite masses and dolerite dyke swarms metamorphosed under greenschist and amphibolite facies conditions. This northern part appears to have been derived from deeper crustal levels than the southern part of the island where the rocks are mainly fresh or slightly metamorphosed lavas and volcanic breccias that are cut by many dykes. The basalts and dolerites more closely resemble ocean floor rocks than four representative groups of basalts and andesites from island arc and oceanic volcano environments. The rocks of the island could have been formed at a spreading zone in an oceanic environment. A hypothetical vertical section would probably consist of an upper layer of slightly metamorphosed extrusive rocks overlying a lower level of amphibolite facies dolerite dyke swarms, gabbros, and serpentinized peridotites.

E-11266
Shultz, C.H.
ERUPTION AT DECEPTION ISLAND, ANTARCTICA, AUGUST 1970. Geological Society of America. Bulletin, Sept. 1972 83(9), Ohio State University. Institute of Polar Studies. Contribution No. 228. p.2811-2820, 3 refs.

GEOL

The eruption in August 1970 in the South Shetland Is., Antarctica, was the most violent explosion that has occurred over the past four years of recent activity. Fine-grained salty tephra of andesite composition was spread over the northern half of the 14 km wide island from 6 main-type native craters and 7 land vents. One land crater was developed in glacial ice. Further activity is anticipated.

E-11293
Gondwana Symposium, 2nd, South Africa, July-August 1970
PROCEEDINGS AND PAPERS. Pretoria, Council for Scientific and Industrial Research, 1970, 689p., Numerous refs.

The Second Gondwana Symposium was held at the invitation of the Government of the Republic of South Africa under the aegis of the International Union for Geological Sciences. A total of 158 persons registered as attending participants, of whom 74 were from countries outside the Republic of South Africa. Sessions for the presentation of papers were held at the University of Cape Town, from July 3-8, inclusive, and at the University of the Witwatersrand, Johannesburgh, from July 21-24, inclusive. The symposium proceedings contains 79 papers arranged under the following headings: Review papers, Plenary papers, Lecture, Geologic history and continental reconstruction, Stratigraphy, Petrology, Glaciology, and Paleontology. For abstracts of papers which include substantive information on Antarctic regions see E- 11293 to E- 11310.

E-11293
Amos, A.J. , Rocha-Campos, A.C.
REVIEW OF SOUTH AMERICAN GONDWANA GEOLOGY 1967-1969. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.1-13, 190 refs.

In the 2 yr since the 1st Gondwana Symposium, a tremendous wealth of information has been produced. Almost 200 papers appeared in this period covering the geological sciences from palynology to paleomagnetism. About 80 papers were on Gondwana paleontology, and the rest are mostly stratigraphical. Radiometric ages of rocks from Precambrian to Pliocene are undoubtedly the most interesting determinations relating to continental drift given during this period. Also,paleomagnetic studies of Trias and younger rocks contributed to this problem and to the age of separation of South America and Africa. The history and origin of the South Atlantic Ocean were presented on various evidence. A number of papers on radiometric age determinations and paleomagnetic studies of Antarctic regions have been included.

E-11294
Adie, R.J.
REVIEW OF ANTARCTIC GEOLOGY. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.15-22, Refs.

Over the past 15 yr, 12 countries have participated in the investigation of the geology of Antarctica by undertaking broad programs of mapping; both the field programs and the results have been coordinated by the Scientific Committee on Antarctic Research. There are problems of stratigraphical nomenclature and correlation that have naturally arisen from the exploration of new areas. Antarctica can be divided into 2 distinctive geological provinces, the Gondwanan and Andean, which almost coincide with the physiographical provinces. The continental shield of East Antarctica is formed by a basement composed of ancient complexly metamorphosed rocks and igneous intrusions which have been affected by at least 2 major and 2 minor orogenies. In strong contrast is the Andean Province of the Antarctic Peninsula and West Antarctica, where an ancient basement is absent. This region is the trace of the Carboniferous marginal geosynclinal belt, which has been subsequently modified by at least 6 intrusive phases, 3 important volcanic episodes, and 2 major orogenies. Folding and late Tertiary block-faulting, with associated volcanism, have been responsible for the present form of the Antarctic Peninsula and much of West Antarctica. The stratigraphical, structural and tectonic problems of Antarctica are reviewed in

the light of recent field investigations.

E-11295
Creer, K.M.
REVIEW AND INTERPRETATION OF PALEOMAGNETIC DATA FROM THE GONDWANIC CONTINENTS. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.55-72, 96 refs.

The polar-wander curves, deduced from paleomagnetic studies of rocks from South America, Africa, Australia, India, and Antarctica are described. They have been used to deduce how these continents were arranged when they were united forming Gondwanaland. They also provide a new method of correlation of magnetic ages of rock formations in the different continents. The South Pole wandered across Gondwanaland from the vicinity of Dakar in the lower Paleozoic, through South Africa in the lower Carboniferous and across Antarctica almost as far as Australia in the Permo-Carboniferous. It is deduced that Laurasia was joined to Gondwanaland throughout the middle and upper parts of the Paleozoic era and that rifting between NW Africa and the eastern U.S. occurred at the end of the Triassic. Within Gondwanaland, the earliest movement appears to have involved Australia during the Permo-Triassic. The development of the S Atlantic appears to have started by the Jurassic. In the late Mesozoic and Tertiary, the polar wander curves for the different continents diverge when plotted against the Gondwana geography, showing that by then this had changed.

E-11296
Frakes, L.A. , Crowell, J.C.
GLACIATION AND ASSOCIATED CIRCULATION EFFECTS RESULTING FROM LATE PALEOZOIC DRIFT OF GONDWANALAND. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.99-109, 37 refs.

The present distribution of late Paleozoic deposits of glacial derivation in all the southern continents, and including India is random with respect to latitude but may be explained without resorting to extra-terrestrial causes by the passage of a reconstructed Gondwanaland over the South Rotational Pole during Paleozoic time. The shape of Gondwanaland was long and relatively narrow--the length stretching from Columbia in South America across southern Africa and East Antarctica to Queensland in northeastern Australia, and the width essentially being represented by the length of Africa from the United Arab Republic to the South African Coast. This continental block in the late Paleozoic was positioned on the South Rotational Pole and served to deflect equatorial oceanic currents from their normal axial flow into north-south paths. By early Permian time, Gondwanaland had drifted so that the South Rotational Pole lay in East Antarctica and a major ice sheet extended into southern Australia. Many conditions were favorable for the initiation and migration of glaciation in Gondwanaland in late Paleozoic time and that much resulted from the motion of the supercontinent with respect to the rotation axis.

E-11297
Romer, A.S.
TETRAPOD VERTEBRATES AND GONDWANALAND. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.111-124, 168 refs.

The objective in the present paper is to review the early tetrapods of the continental areas believed to have been parts of ancient Gondwanaland, citing evidence, pro and con, concerning the possible early direct terrestrial connections between these areas. The evidence indicates (1) continental connections during much of the Permian-Triassic time period between Laurasia and the Gondwanaland region, particularly Africa, and (2) direct connections between southern continents, particularly between South Africa and South America. The distribution of Mesosaurus argues strongly for easy migration between the two continents at the beginning of Permian times. In the early Triassic the presence of the identical genera Cynognathus and Kannemeyeria in both continents is close to absolute proof of the presence of a direct South Atlantic land connection. Further, the presence of Lystrosaurus in Antarctica indicates the connection of that land mass with some other Gondwana element in the early Triassic. In the middle Triassic the close similarity of the traversodonts of South America and Africa strongly suggests that southern intercontinental interchange was possible at that time. Some notes on fishes and on tetrapods of other periods are given.

E-11298
Teichert, C.
MARINE FOSSIL INVERTEBRATE FAUNAS OF THE GONDWANA REGION. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.125-138, 107 refs.

Marine fossil invertebrate faunas are reviewed from the latest Precambrian until the end of the Jurassic period to investigate the nature of the contribution that knowledge of these faunas can make to the question of continental drift. For the Late Precambrian a shallow sea covering parts of Australia and South West Africa can be postulated. No equivalents of the Ediacara fauna have been reported so far from South America, Peninsular India, and Antarctica, but the fauna is widespread in other parts of the world. In the Cambrian the Archaeocyatha fauna of Antarctica shows poor agreement with that of South Australia. If the two faunas had existed in one continuous trough one would expect the similarities to have been much greater. Middle and Upper Cambrian faunas of Antarctica seem to have few or no correlatives in South Australia. In the Early Devonian a marine biogeographic (Malvinocaffric) province is clearly delineated, comprising parts of South America, South Africa, and Antarctica but not Australia and New Zealand. No marine antarctic faunas are known from the Ordovician, Silurian, Carboniferous, Permian, or Triassic periods. Also, there is no marine Jurassic in East Antarctica.

E-11299
Plumstead, E.P.
RECENT PROGRESS AND THE FUTURE OF PALAEOBOTANICAL CORRELATION IN GONDWANALAND. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.139-149, 39 refs.

Acceptance of the principle of continental drift is considered essential to an understanding of the sequence and distribution of fossil floras within the wide-flung confines of Gondwanaland. Some of the problems encountered in making accurate paleobotanical correlations in this

region are lack of communications between paleobotanists in various portions of Gondwanaland, difficulties in classifying Glossopteridae due to its many superficially similar species and large number of hybrids, and lack of a central library and museum of reference. Four new and as yet undescribed plant fossils which are considered potentially valuable as index fossils, include an antarctic assemblage, Gangamopteris obovata Carr, Walikalia Hoeg & Bose etc., which provides a link between the lowest Gondwana (Upper Carboniferous) of Milorgfjetta in Antarctica and other Lower Gondwana areas. The composition of the flora with central African and Indian affinities is of considerable value in understanding the spatial development of Gondwana floras. It fills a gap in Antarctic Gondwana stratigraphy and has features in common with the older Gangamopteris flora associated with tillite in each continent.

E-11300
Haughton, S.H.
GONDWANA AND THE GEOLOGIST. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.151-155

The stratigraphy and history of the Gondwana system are discussed. Considerable attention has been given to the evidence afforded by the distribution of Glossopteris - Gangamopteris fossil flora during the late Palaeozoic era in the lands of the southern hemisphere. This flora has been recorded from India, Australia, Antarctica, southern and equatorial Africa, and South America. The first Antarctic representatives were collected by Captain Scott's polar party and were found in their collection by the group that discovered the bodies of Scott and his companions. Palaeobotanists appear to be at one in concluding that the continental regions in which this fossil flora has been preserved could not have been widely separated one from the other at the time when this flora flourished and contributed its quota to the formation of coal seams of late Palaeozoic age. Also of particular interest are the fossils of land-dwelling reptiles that lived in late Carboniferous, Permian, and Triassic times. The greatest number of these remains have been found in South Africa and have been classified for the most part as Therapsids. During the past 2 yr therapsids and diapsids (also representative of South Africa) have been found in Beacon beds at Coalsack Bluff in Antarctica.

E-11301
Loczy, L. de
GONDWANALAND PROBLEMS IN THE LIGHT OF RECENT PALEOGEOGRAPHIC AND GEOTECTONIC RECOGNITIONS. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.175-178, 26 refs.

It is suggested that the geological age limits for Gondwana sequences should be extended from early Paleozoic to Lower Cretaceous instead of the original limits, from upper Carboniferous to Jurassic. The writer's previous paleogeographic and geotectonic studies indicated that South America and Africa were separate continents by Early Devonian time. The recent discovery of marine Ordovician-Silurian faunas in South Africa and in Northwest Africa and the recent geotectonic recognitions in South America suggest that separation of the continents may have occurred earlier. It is suggested that the Glossopteris-Gangamopteris flora and the Triassic amphibian and reptile faunas found in the strata of Antarctica provide no convincing basis for dating the breakup of Gondwanaland after Permo-Carboniferous time.

E-11302
Barrett, P.J.
STRATIGRAPHY AND PALEOGEOGRAPHY OF THE BEACON SUPERGROUP IN THE TRANSANTARCTIC MOUNTAINS, ANTARCTICA. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.249-256, 64 refs.

The Beacon Supergroup in the Transantarctic Mountains is largely a flat-lying nonmarine sequence from Devonian or older to Jurassic in age. It rests unconformably on a Precambrian and lower Paleozoic basement, and is intruded and overlain by Jurassic basaltic rocks. The Taylor Group, largely a quartzose sandstone succession, is exposed between the Mawson and Beardmore glaciers, and reaches a thickness of 1,100 m. The only datable fossils are lycopod stems and fish remains of Devonian age from the uppermost strata, but there is a thin marine sequence of Lower Devonian age in the Ohio Range. The bulk of the Taylor Group was derived from a shield area to the west. Thick folded sequences of similar age and lithology crop out in the Pensacola and Ellsworth mountains. The Victoria Group is a heterogeneous sequence of glacial beds, carbonaceous and noncarbonaceous alluvial plain sediments, and volcaniclastic strata from Permian to Jurassic in age. Permian or Triassic plant fossils are found at most places. A stratigraphic correlation chart of Beacon formations in the Transantarctic Mountains is presented.

E-11303
Harrington, H.J.
RECENT ADVANCES IN THE STUDY OF THE BEACON SUPERGROUP IN THE TRANSANTARCTIC MOUNTAINS. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.257-264, 126 refs.

The single most important development in knowledge of the Beacon Supergroup has been the publication by the American Geographical Society in 1969 of a string of geological maps of the Transantarctic Mountains on a scale of 1 to 1 million with explanatory texts. The Beacon Group is shown as well as the folded correlatives of the Beacon Group in the Ellsworth Mountains and the Pensacola Mountains. Petrographic studies have revealed that many of the Permian and Triassic strata in the Beardmore region are volcaniclastic. The discovery of a bone fragment of a labyrinthodont amphibian in the lower part of Fremouw Formation near the upper Beardmore Glacier is probably the most exciting development. Advances in studies of the lithostratigraphy and paleography of the Beacon Supergroup are also discussed.

E-11304
Elliot, D.H. , Collinson, J.W., Powell, J.S.
STRATIGRAPHIC SETTING OF THE TRIASSIC VERTEBRATES OF ANTARCTICA. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.265-271, Ohio State University. Institute of Polar Studies. Contribution No. 182. 17 refs.

Recent discoveries of fossil tetrapods in Antarctica have all been in the lower part of the

Fremouw Formation in the Transantarctic Mountains near Beardmore Glacier. The Fremouw Formation is a Triassic floodplain deposit within the widespread sequence of mainly nonmarine Beacon rocks, which range in age from Devonian (?) to Triassic-Jurassic. Coarse channel sandstones near the base of the Fremouw Formation contain bones that occur as disarticulated fragments associated with quartz pebbles and mudstone pebbles and cobbles. Discovery sites now include Graphite Peak, Mount Sirius, an outcrop northeast of Mount Marshall, and Coalsack Bluff, the last-named locality being the most productive to date. The fossil tetrapods confirm the Triassic age of the Fremouw Formation, which was previously assigned that age on the basis of stratigraphic position and the occurrences of the fossil plant Dicroidium odontopteroides in its upper part.

E-11305
Elliot, D.H.
MESOZOIC VOLCANIC ROCKS OF THE BEARDMORE GLACIER AREA, ANTARCTICA. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.421-431, Ohio State University. Institute of Polar Studies. Contribution No. 181. 42 refs.

The Late Triassic-Early Jurassic Prebble Formation consists of mudflow debris and pyroclastic rocks which represent the culmination of an episode of volcanism recorded in the underlying Triassic sedimentary formations by volcanic detritus and tuffs. The Mawson Tillite is the only known unit in a similar stratigraphic position with similar lithology. The Prebble Formation is overlain by the Kirkpatrick Basalt, comprising at least 525 m of Jurassic tholeiitic flood basalts. Similar lavas crop out in isolated areas between the Queen Alexandra Range and northern Victoria Land, where there is an extensive field of flood basalts about 1370 m thick. Although no lithologic equivalent of the Prebble Formation has been found either in southern Africa or the Parana Basin, the Gondwana Triassic succession of western Argentina and several Triassic basins in eastern Australia contain volcanic material. Basalts in the same stratigraphic position as the Kirkpatrick Basalts crop out in southern Africa and India; however, in South America, the basalts of the Serra Geral Formation are significantly younger. The Kirkpatrick Basalt, the correlative Ferrar Dolerite of Antarctica, and the Tasmanian Dolerites have geochemical characteristics which have established a magmatic province and provide a major contrast with the other Gondwana Mesozoic tholeiites.

E-11306
Crowell, J.C. , Frakes, L.A.
ANCIENT GONDWANA GLACIATIONS. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.469-476, 59 refs.

The distribution of glacial sediments and related facies in the Gondwana continents, supplemented by data from directional-current structures, preserved geomorphic glacial features, and published paleomagnetic data, confirm the inference of du Toit and of King that late Paleozoic glaciation in southern Africa and then-adjacent continents is largely due to the migration of united Gondwanaland across the south pole. Glaciation developed in the early Carboniferous in southern Africa and nearby South America, culminated in this region during late Carboniferous, and rapidly waned during the Permian. In Antarctica and Australia, on the other hand, continental glaciation waxed in the latest Carboniferous and culminated in the Permian. The timing of these waxings, culminations, and wanings is compatible with paleomagnetic information as well as with the concept of a united Gondwana super-continent moving across the south pole. Comparisons of Paleozoic paleogeographic configurations in the southern hemisphere with those of the Cenozoic in the northern hemisphere suggest that a basic cause of ice ages is the arrangement of continental masses and their effect on air-ocean circulation.

E-11307
Lindsay, J.F.
NATURE OF THE PALEOZOIC GLACIATION IN ANTARCTICA. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.477-481, Ohio State University. Institute of Polar Studies. Contribution No. 180. 16 refs.

The extent and apparent continuity of the Paleozoic glacial deposits and the consistency in paleo-ice direction in Antarctica suggest an ice sheet of continental dimensions centered in southern Victoria Land. In the central Transantarctic Mountains 126 m to 395 m of glacial sediments were deposited from actively deforming temperate ice which flowed to the southeast. The central Transantarctic Mountains were possibly situated in middle latitudes during the glaciation, although the continental dimensions of the ice sheet suggests that it also extended into higher and lower latitudes. Between advances of the ice, streams, some of them quite large, flowed across the area and were locally diverted or dammed by the retreating ice front.

E-11308
Rakotoarivelo, H.J.
PALYNOSTRATIGRAPHIC REVIEW OF THE COAL BASIN OF THE SAKOA-SAKAMENA (MADAGASCAR). Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.537-540

An account is given of palynostratigraphic work whose essential feature is to relate the coal-bearing beds of the sediments of the Sakoa group, of the Lower Karroo or Lower Gondwana System occuring in the Sakoa-Sakamena basin of SW Madagascar, to geological formations which are believed to be of similar age in the principal palaeogeographic regions of Gondwanaland. Palynological analysis indicates that the coal-beds belong to the lower Barakar stage of the Damuda Series in India. The Malagasy coal-beds are compared to Gondwanic formations which are believed to be of the same age according to the palynological data in the following countries: India, South Africa, Tanzania, Congo-Kinshasa, Australia and the Antarctic continent. These beds very probably are also referable to other Gondwanic formations occuring both in Africa (Mozambique, Rhodesia, Zambia) and in South America (Brazil, Uruguay, Argentina and the Falkland Is.).

E-11309
Tasch, P.
ANTARCTIC AND OTHER GONDWANA CONCHOSTRACANS AND INSECTS: NEW DATA; SIGNIFICANCE FOR DRIFT THEORY. Gondwana Symposium, 2nd, South Africa,

July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970. p.589-592, 17 refs.

Several conchostracan beds occur at different elevations in the Antarctic Queen Alexandra Range and in the Patagonian Jurassic. Mauger Nunatak, Antarctica, contains a few specimens of the conchostracan genus Paleolimnadia. This genus also occurs in the upper Permian and/or Triassic of New South Wales, Brazil, Bolivia, and South Africa. Conchostracans have been reported from Devonian fish beds of the Lashly Mountains, Antarctica. Preliminary examination indicates preservation too poor for identification. Nevertheless a likely source is the Australian Devonian. Patagonian cyziciid conchostracans, two subgenera, from Canadon Asfalto formation have relatives in the Jurassic of Antarctica, Mozambique, India and elsewhere. Besides faunal similarity there is a more striking aspect of Mesozoic conchostracan occurences in Patagonia, Central Transantarctic Mountains, Victoria Land and Mozambique; fossils occur in freshwater interbeds of volcanic or intrusive sequences. Antarctic fossil insects point to a transantarctic migratory route from Permian through Jurassic (possibly Cretaceous) time. An outstanding feature of Antarctic insects (both Paleozoic and Mesozoic) is their affinities to Asiatic and/or Russian or Australian forms. These data require proximity of Australia and Antarctica and grouping of southern hemisphere continents around Antarctica from at least Devonian through Jurassic time.

E-11310
Colbert, E.H.
ANTARCTIC GONDWANA TETRAPODS. Gondwana Symposium, 2nd, South Africa, July-August 1970. Proceedings and papers, Pretoria, Council for Scientific and Industrial Research, 1970, p.659-664, 19 refs.

This discussion indicates that the Lower Triassic tetrapods found at Coalsack Bluff, near the Beardmore Glacier, are closely comparable to tetrapods of this age in South Africa and in Asia, with Lystrosaurus as the key in this chain of faunal relationships. The association of labyrinthodonts and thecodonts with Lystrosaurus strengthens the evidence. Certainly such resemblances, emphasized by the obviously close similarities between Lystrosaurus murrayi of South Africa and the fossils of this genus found in Antarctica and in India, is strong evidence that these animals were once constituents of a single fauna inhabiting Gondwanaland. The animals that composed the Lystrosaurus fauna were thoroughly terrestrial types; they could have moved between Antarctica and Africa only along a dry-land route. This route would appear to have been across the southeastern boundary of the African land mass and the Queen Maud Land region of Antarctica, past the present polar region, to the vicinity of the present Transantarctic Mountains. The evidence afforded by the Triassic tetrapods that Atarctica was a part of Gondwanaland is strong almost to the point of certainty.

E-11313
Zamoruev, V.V.
GEOMORPHOLOGY OF THE SOUTH SHETLAND ISLANDS. Geomorfolcgiia IUzhno-Shetlandskikh ostrovov. Geomorfologiia, Jan.-March 1972 No.1, p.77-84, In Russian, with English summary. 22 refs.

The South Setland Islands are mainly formed by volcanic rocks of the Cenozoic age. Faults parallel with the archipelago's direction (NE-SW) were of great importance for the formation of the shore lines of the largest islands (King George, Livingston). The Islands are covered by ice caps and there are only a few oases. Rather common are abrasion platforms 40-50 m high of the preglacial age and raised beaches up to 15-16 m high, which formed in the areas that were left free by contracting glaciers. The South Shetland Islands are a region of present volcanism. Traces of the eruption that happened on Dec. 4, 1967 in the Deception Island are described. The principal recent relief forming processes in ice-free areas are frost weathering, solifluxion and the activity of sea.

E-11318
Brook, D.
PHYSIOGRAPHY AND GLACIAL GEOMORPHOLOGY OF THE THERON MOUNTAINS. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.25-37, 18 refs.
QH84.2.B72

The physiography of the Theron Mountains is described with particular reference to weathering processes, glacial activity, melt phenomena, and patterned ground. The main physiographical feature is the undulating snow-covered plateau area with isolated nunataks which terminates abruptly to the north-west in the frontal scarp of the Theron Mountains and to the south in the ice-cliff margin of Slessor Glacier. Although there is no direct evidence of major faulting, these features are considered to be fault scarps but there is no evidence as to their age except that they are post-Jurassic. Stephenson (1966;E - 9695) inferred that the sharp profile of the frontal scarp implied youth but this profile may have simply resulted from the dominant erosion agent being frost action. Other erosion agents, such as water, wind and chemical weathering, are locally significant. The main glacial activity in the Theron Mountains is restricted to "Main Glacier" and its three principal tributaries. Cirque and niche glaciers are present but they are not particularly important. Moraines are all locally derived and they are restricted to "Main Glacier" and the lower reaches of its tributaries. Melt pools, which often have expansion mounds on their surfaces, are similarly restricted. There is little evidence of recent glacial retreat and none of multiple glaciation. Patterned ground is restricted to the cliff tops but it is present throughout the mountain range. One possible example of "fossil" patterned ground was observed.

E-11321
Taylor, B.J.
URDIDID ISOPOD FROM THE LOWER CRETACEOUS OF SOUTH-EAST ALEXANDER ISLAND. British Antarctic Survey. Bulletin, Jan. 1972 No.27, p.97-103, 25 refs.
QH84.2.B72

An Aptian urdidid isopod with a well-preserved pleotelson from a locality near Fossil Bluff, south-east Alexander I., represents the first Urda outside Europe and only the fourth fossil isopod occurrence in the Southern Hemisphere. The specimen is similar to Urda cretacea Stolley (Upper aptian- Lower Albian), which was destroyed during World War II. The Urdidae probably represent ancestral cirolanids from which extant gnathiids were derived.

E-11336
Clark, C.C.
GEOPHYSICAL STUDIES OF PERMAFROST IN THE DRY VALLEYS. Dekalb, Northern Illinois University, 1972. 97p., Master's thesis. 76 refs.

Electrical depth sounding, seismic

refraction profiling, and laboratory electrical and seismic measurements are used to describe the occurrences and types of permafrost and depth to bedrock in the Dry Valley region, Antarctica. In topographic depressions, especially near lakes, confining permafrost is thin or absent; whereas, in the uplands and on moraines it my be thick (greater than 1,000 m). Areas where confining permafrost is thin or absent are: Don Juan Pond, Don Quixote Pond, Lake Bonney area, Lake Vanda area, Walcott Glacier, and near Lake Fryxell. Areas where it is thick are: Lake Vida, Lake Miers, and the shore of New Harbor. Laboratory measurements indicate resistivities of saturated rocks, soils, and saline solutions increase exponentially with decreasing temperature. Abnormally high compressional wave velocities for ice (4,293 m/sec) were recorded on Lake Vida. The velocity of a saturated, low-porosity rock decreases with decreasing temperature, whereas the velocity of a porous, fractured rock appears to increase with decreasing temperature.

E-11355
Jones, L.M.
ISOTOPIC COMPOSITION AND CONCENTRATION OF STRONTIUM OF THE BRINE FROM TUBORG LAKE, ELLESMERE ISLAND. Arctic, June 1972 25(2), p.155-156, 11 refs.
G600.A695

Recently, the isotopic composition of strontium, conveniently expressed as the SR-87/SR-86 ratio, has been used to indicate the source of dissolved salts in Lakes Vanda and Bonney, southern Victoria Land, Antarctica. The SR-87/SR-86 ratio of surface water depends on the Rb/Sr ratios and ages of the rocks exposed in the drainage basin. The isotopic composition of strontium in sea water is constant (SR-87/SR-86 equals 0.7093) and can therefore be useful in identifying marine strontium. Measurements of the SR-87/SR-86 ratio of brine from Lake Tuborg, Ellesmere I. (90 m depth) gave a value of 0.7096, which is in satisfactory agreement with the accepted value for modern sea water. The concentration of strontium was somewhat less than that of normal sea water.

E-11356
Chase, C.G.
N PLATE PROBLEM OF PLATE TECTONICS. Geophysical journal, Aug. 1972 29(2), p.117-122, 8 refs.
QC801.G382

Plate tectonics theory is used to develop a least squares method for finding all the relative motions of any n interacting plates simultaneously. The method ensures internal consistency of results and allows full use to be made of data on relative movement of plates. The least squares fitting criteria are chosen to avoid ambiguity. Relative motions of eight major plates of the world are calculated in preliminary form, and regional and global rates of creation and destruction of lithosphere are derived from these motions. The plates and their boundaries are plotted. Seven of them are large, and together cover much of the Earth's surface. They are: AME--North and South America; PAC--Pacific; NAZ--Nazea plate; EUA--Europe and Asia; AFR--African plate; IND--plate containing India and Australia; ANT--Antarctica. The eighth plate, COC for Cocos, is smaller, but is included because of the wealth of data concerning its movement relative to the larger plates surrounding it. For all the plates, 176 directions of relative motion and 59 rates of plate separation by sea-floor spreading were selected from published and unpublished sources.

E-11373
Katz, M.B.
PAIRED METAMORPHIC BELTS OF THE GONDWANALAND PRECAMBRIAN AND PLATE TECTONICS. Nature, Sept. 29, 1972 239(5370), p.271-273, 23 refs.
Q1.N22

Reconstructions of Gondwanaland, based on geological arguments, paleomagnetic data and best fit of continents have derived two possible models of reassembly. The most popular places India-Ceylon adjacent to East Antarctica; the other places it next to Western Australia. The exact position of Madagascar in these models has been the subject of some debate, but it is now placed north of its present position against East Africa. Both models have reasonable geological correlations, but a rigorous test of fits based on Precambrian basement correlations has been attempted in a limited way only between India-Ceylon, Western Australia and East Antarctica. Tracing out dispersed Precambrian belts to test continental drift has also been applied to fits between Brazil and Gabon. It is shown that Precambrian granulite facies, paired metamorphic belts can be traced throughout the basement rocks of Gondwanaland. The significance of these paired belts in terms of plate tectonics during the Precambrian is also discussed.

E-11375
Burke, K. , Wilson, J.T.
IS THE AFRICAN PLATE STATIONARY? Nature, Oct. 13, 1972 239(5372), p.387-389, 45 refs.
Q1.N2

The islands of St. Helena, Tristan da Cunha and Gough lie respectively 500 km, 450 km and 450 km east of the crest of the Mid-Atlantic Ridge. It is suggested that they overlie hot spots or convective plumes in the mantle and that the Walvis Ridge is the trail of hot spot marking the relative motion of the African plate over the mantle since the opening of the South Atlantic. It is further suggested that the termination of the ridge at Tristan and Gough records the cessation of this relative motion. That this occurred about 25 m.y. ago is indicated by a spreading rate of 1.7cm/yr/side and because the two islands lie just east of magnetic anomaly six. Spreading of the sea floor continued and has moved the crest west from the hot spots. The Discovery and Meteor seamount chains are concentric with the Walvis Ridge; they too terminate some distance east of the crest of the Mid-Atlantic Ridge and may also be hot spot trails terminating on the same isochron.

E-11377
Kennett, J.P. , Burns, R.E., Andrews, J.E., Churkin, M., Jr., Davies, T.A., Dumitrica, P., Edwards, A.R., Galehouse, J.S., Packham, G.H., Van der Lingen, G.J.
AUSTRALIAN-ANTARCTIC CONTINENTAL DRIFT, PALAEOCIRCULATION CHANGES AND OLIGOCENE DEEP-SEA EROSION. Nature physical science, Sept. 25, 1972 239(91), p.51-55, 61 refs.
Q1.N22

Deep-sea drilling in the SW Pacific has revealed a vast regional unconformity of Oligocene age that resulted from deep sea erosion induced by paleocirculation changes related to Australian continental drift and Antarctic glacial episodes. The unconformity is present in both ridge and basin areas of the Tasman and Coral Seas in present-day water depths varying from 1,400 m to 4,600 m. Three hypotheses to explain this widespread unconformity are described. Critical tests of the hypotheses must

await drilling in areas south of Australia. The paleocirculation changes also appear to have played a major role in the distribution and evolution of Cainozoic planktonic assemblages.

E-11378
Wegner, W. , Craddock, C.
LEXICON OF ANTARCTIC STRATIGRAPHIC NAMES. Washington, National Academy of Sciences, July 1972, 129p.

At its 1968 meeting in Tokyo, the Working Group on Geology of the Scientific Committee on Antarctic Research (SCAR) discussed the need for a Stratigraphic Lexicon of Antarctica, and it was agreed that each SCAR nation should prepare a list of entries that would include all stratigraphic names introduced by members of its own expeditions. In addition to U.S. expedition members some individuals with strong ties to the U.S. program are included, even though some of their work has been with the expeditions of other nations, for the sake of completeness. Some stratigraphic names are modified or formalized by later workers. Names so altered by U.S. geologists are included. Some stratigraphic names become obsolete, and these are so designated where known. The locations of major features are given by region in Antarctica, those of minor features by longitude and latitude. Information on the age of a rock unit is included if mentioned in the reference work or otherwise known, but no effort has been made to compile all age evidence reported in the literature. This work is not intended as a critical appraisal of the validity of terms, but merely as a compilation of the names that have been introduced. In general the original usage has been followed without regard to current stratigraphic conventions.

E-11436
Barrett, P.J.
STRATIGRAPHY OF THE POSTGLACIAL BEACON ROCKS IN THE QUEEN ALEXANDRA-QUEEN ELIZABETH RANGE AREA, ANTARCTICA. Columbus, Ohio State University, [1967], 66p., Unpublished manuscript. 27 refs.

A description is given of the post glacial Beacon geology in the Queen Alexandra and Queen Elizabeth Ranges area determined during the season 1966-1967. The Beacon sequence is comprised of eight formations: the Alexandra, Pagoda, Mackellar, Fairchild, Buckley, Fremouw, Falla, and Prebble formations. The geology of each formation is discussed. The Beacon sequence is capped by flows of Kirkpatrick Basalt (Jurassic), and has been extensively intruded by sheets of dolerite. Paleocurrent directions were measured in every formation but the Prebble Formation. Data relating to the measurements are given, and the directions, which were determined mainly from festoon bedding and micro-crosslamination, are summarized.

E-11451
Lopatin, B.G.
GEOLOGY OF THE FOLDED BASEMENT IN THE MCMURDO OASIS (VICTORIA LAND). O geologii skladchatogo fundamenta v cazise Mak-Merdo (Zemlia Viktorii). Antarktika; doklady komissii, 1969, pub. 1971, p.60-74, In Russian. 32 refs.
G576.A65

Preliminary results are given of field surveys made in 1968 on the pre-Beacon folded basement of the Transantarctic Mts. in the McMurdo dry valleys of southern Victoria Land. The data show a metamorphic complex divided into three series, bottom upwards: gneissic (not less than 4000 m thick), gneiss-schist (2000 m thick) and marble-schist (1000 m thick). The lowest series comprises the gneiss-magmatite pre-Cambrian layer (?), the other two series are related to the Upper-Proterozoic and Lower Paleozoic "Ross Supergroup" (see E-625). Preorogenic, synorogenic and postorogenic intrusive formations distinguished in the McMurdo Oasis are discussed.

E-11452
Rozenberg, V.I.
SOME IMPLICATIONS OF GEOPHYSICAL INVESTIGATIONS IN ANTARCTICA. Nekotorye rezul'taty interpretatsii geofizicheskikh issledovanii Antarktidy. Antarktika; doklady komissii, 1969, pub. 1971, p.75-88, In Russian. 27 refs.
G576.A65

Data on the subglacial relief and crustal thickness of Antarctica obtained by seismic and gravimetric studies are given, and a method used in compiling charts for the data is discussed. On the basis of seismic observations, made by the wave-refraction method and aeromagnetic reconnaissance, features of Antarctic tectonics are described.

E-11453
Solov'ev, D.S.
GEOLOGICAL STRUCTURE OF MOUNTAIN FRINGES OF THE LAMBERT AND AMERY GLACIERS. Geologicheskoe stroenie gornogo obramleniia lednikov Lamberta i Emeri. Antarktika; doklady komissii, 1969, pub. 1971, p.89-101, In Russian. 13 refs.
G576.A65

Mountain regions of the Lambert and Amery Glaciers belong to the Pre-Riphean Antarctic platform and have a three-layer structure. The lower layer is composed of the Archean, highly dislocated strata of gneisses and crystalline schists of granulitic and amphybolitic facies of regional metamorphism; the middle layer consists of Meso-Proterozoic folds of quartzites, phyllites, jaspites and crystalline limestones of the greenschist facies of regional metamorphism; and the upper layer is Upper-Paleozoic, non-metamorphic terrigenous sedimentations in the platform mantle. The sedimentations of the platform mantle are similar to those found in the Upper-Paleozoic layer (Beacon group) of Victoria Land, but differ mainly in lacking the trap-like magma of the mountain fringe of the Lambert and Amery Glaciers.

E-11454
Bardin, V.I. , Konopleva, V.I.
PROCESSES OF WEATHERING AND PROBLEMS IN THE GEOCHRONOLOGY OF THE ANTARCTIC GLACIAL PERIOD. O protsessakh vyvetrivaniia i probleme geokhronologii lednikovogo perioda Antarktidy. Antarktika; doklady komissii, 1969, pub. 1971, p.102-112, In Russian. 12 refs.
G576.A65

The results of analytical studies, carried out in the mountains of Queen Maud Land in 1967, of weathering in boulders, grano-syenite, and biotite-garnet gneisses are given. Tabulated are data on the chemical composition of gneisses. Investigations of geochemical supergene processes can be used in the future as a stratigraphic indicator of the antarctic seas. Since the radiocarbon method is difficult to use, the chronology of the antarctic glacial period can be determined by studies of weathered rocks.

E-11455
Bardin, V.I. , Sudakova, N.G.
"LOESS" OF ANTARCTICA. Antarkticheskii "less". Antarktika; doklady komissii, 1969, pub. 1971, p.113-121. In Russian. 11 refs.
G576.A65
Characteristics and origin of wind-blown-silty loam (loess) found in morainic deposits of Enderby and Queen Maud Lands during the 12th Soviet Antarctic Expedition were studied. The results of granulometric, mineralogical and chemical analyses and data on cross-sections of undisturbed loess texture are discussed. It was concluded that this type of sediments was formed in puddles on the moraines and was due to frost weathering.

E-11469
Halpern, M. , Rex, D.C.
TIME OF FOLDING OF THE YAHGAN FORMATION AND AGE OF THE TEKENIKA BEDS, SOUTHERN CHILE, SOUTH AMERICA. Geological Society of America. Bulletin, June 1972 83(6), Texas. University at Dallas. Geosciences Div. Contribution No. 200, p.1881-1886, 13 refs.
QE1.G2
The marine Lower Cretaceous to Upper Jurassic (?) Yahgan Formation of southern Chile was orogenically folded between late Early Cretaceous and middle Late Cretaceous time. Biotite and hornblende from dicrite bodies intrusive into the folded Yahgan Formation have been dated at 79 m.y. by the Rb-Sr and K-Ar methods, thus setting the younger limit to the age of folding of the formation. Hornblende from greenstone at Bertrand I., which is considered contemporaneous with deposition of the Yahgan Formation, but recrystallized during the folding of the sedimentary sequence has a K-Ar date of 92 m.y. At Burleigh Peninsula, the Tekenika conglomeratic beds, generally accepted as Jurassic in age, are considered as Late Cretaceous to early Tertiary. Paleontologic evidence and a K-Ar total rock date of 116 m.y. for a boulder of dioritic gabbro from the Tekenika beds support this stratigraphic revision. (Auth.)

E-11470
Tasch, P.
PERMIAN TRACE FOSSIL FROM THE ANTARCTIC OHIO RANGE. Kansas Academy of Science. Transactions, Spring 1968 71(1), p.33-37, 4 refs.
Q11.K2
A floodplain siltstone of the Permian Mt. Glossopteris Formation (Mercer Ridge, Ohio Range, Antarctica) contained a new vermiform trace fossil (trail). Cochlichnus antarcticus n. sp. is described and figured. This find establishes a second trace fossil zone that is higher in the formation than the basal invertebrate spoor fossils (trails, burrows) reported by Long (1965; E-3217). (Auth.)

E-11471
Tasch, P.
TRACE FOSSILS FROM THE PERMIAN POLARSTAR FORMATION, SENTINEL MOUNTAINS, ANTARCTICA. Kansas Academy of Science. Transactions, Summer 1968 71(2), p.184-194, 11 refs.
Q11.K2
At least one trace fossil Cochlichnus from collections made in the Sentinel Mountains during the austral summer 1966-67 may have affinities with the species of the same genus found in the Ohio Range (Tasch, 1968; 11470). If so, the suspected correlation between the Sentinel Mountain and Ohio Range Permian beds would have this additional piece of evidence in its favor. Since Permian fossils (exclusive of the Glossopteris flora) from the Antarctic, are sparse, and Paleozoic trace fossils from Antarctica, though mentioned, are rarely described, the present paper is written in an effort to begin to fill this gap. It is also the intention to indicat the potential value of Paleozoic trace fossils for regional correlation in the Antarctic.

E-11472
Tasch, P.
ACETATE PEEL AND OTHER BIOTIC DATA FROM SELECTED ANTARCTIC PERMIAN BEDS. Kansas Academy of Science. Transactions, Winter 1970 73(4), p.502-508, 7 refs.
Q11.K2
Published data on fossil biotic elements from the Antarctic Paleozoic, particularly the Permian, are sparse. Additions of any kind, for example, reports on spoor, fragmentary fossils, artifacts among others, can help to expand available knowledge. The present study, part of a large research project, supplements previous reports on the same theme. Collections during austral summer 1966-67 included samples from fossiliferous and non-fossiliferous beds. Of these, samples studied by the acetate peel technique included in this report came from the following localities and beds: Ohio Range--beds O-17, O-19; Sentinel Mts.--bed S-14--Without Nunatak, near the contact of the Polarstar Formation and the Whiteout Conglomerate. Standard acetate peel techniques were used. In addition to acetate peel studies, an object attached to a leaiid conchostracan valve from the Ohio Range Leaia Zone (Bed O-21.8), not previously reported in the literature, is figured and described. (Auth.)

E-11475
Audley-Charles, M.G. , Carter, D.J., Milsom, J.S.
TECTONIC DEVELOPMENT OF EASTERN INDONESIA IN RELATION TO GONDWANALAND DISPERSAL. Nature physical science, Sept. 18, 1972 239(90), p.35-39, 56 refs.
Q1.N22
A reconstruction of the evolution of the Banda Arcs and New Guinea shows their relation to movement of the Australian plate, and throws new light on the development of continents in the southern hemisphere. Major dispersal of Gondwanaland seems to date from the Middle Cretaceous, when Australia began to drift northwards, although probably without significant separation from Antarctica until the Eocene.

E-11477
Gunn, B.M. , Abranson, C.E.
AMSTERDAM ISLAND, AN ISOLATED VOLCANO IN THE SOUTHERN INDIAN OCEAN. Contributions to mineralogy and petrology, 1971 32(2), p.79-92, 20 refs.
QE351.H45
Twelve lavas have been sampled on Amsterdam I., which is an extinct shield volcano located on a transform fault crossing the southeastern branch of the Indian Ocean rise. Chemical analyses show that the lavas have mainly tholeiitic affinities, ranging from olivine tholeiites to plagioclase basalts with accumulation of bytownite. The high alumina lavas are similar to bytownite cumulates dredged from the Indian Ocean rise, and the low alumina lavas resemble tholeiites of Hawaii. The volcano

appears to be in an early stage of evolution from oceanic ridge basalt to an alkaline volcano. (Auth.)

E-11478
Girod, M. , Camus, G., Vialette, Y.
DISCOVERY OF THOLEITIC ROCKS AT SAINT-PAUL ISLAND (INDIAN OCEAN). Sur la présence de tholéites à l'île Saint-Paul (Océan Indien). Contributions to mineralogy and petrology, 1971 33(2), p.108-117. In French with English summary. 39 refs.
QE351.H45

The basalts and dolerites from Saint Paul I. are reinvestigated. New chemical rock analyses show that they are characterized by high Fe, low Mg, and various Al content; they belong to the quartz tholeiites and olivine tholeiites of Yoder and Tilley's classification. Comparison with abyssal tholeiites shows dissimilarity with respect to Al2O3/CaO and FeO/MgO ratios, Sr and Rb content; and Sr 87/Sr 86 values. Bearing in mind the structural position of the island, these differences are discussed.

E-11489
SCOTIA AXIS CONFIRMED. Nature, Nov. 3, 1972 240(5375), p.14-15
Q1.N2

The presence of the postulated spreading center of the arc-trench around the Scotia Sea, confirmed by new data, leads Barker (J-11029) to conclude that the relative motions at the spreading axis are directly complementary to move a small separate plate eastward relative to South America. The similarities and contrasts of the geographical relationship in respect to the East Pacific Rise and the Aleutian Trench and to the marginal basins of the western Pacific suggest inconsistencies. The significance of depth of earthquake foci, symmetry of magnetic anomaly patterns, and simultaneity of activity of both axis and trench in volcanic areas is questioned. The theories of Baker, Barker, and Karig are included in the discussion.

E-11499
Keany, J. , Kennett, J.P.
PLIOCENE-EARLY PLEISTOCENE PALEOCLIMATIC HISTORY RECORDED IN ANTARCTIC-SUBANTARCTIC DEEP-SEA CORES. Deep-sea research, Aug. 1972 19(8), p.529-548. 23 refs.
GC1.D25

Micropaleontological studies have been carried out on seven cores of middle Pliocene to early Pleistocene age (lower to upper Matuyama: t = 0.7 to 2.43 m.y. BP) from northern Antarctic and Subantarctic waters south of Australia and New Zealand. Alternation of cold and warmer-water planktonic foraminiferal faunas define a total of ten climatic warmings. The amplitude of the climatic warmings is somewhat lower than those in the late Pleistocene (Brunhes; t = 0.7 m.y. BP to present day) indicating more uniform Southern Ocean conditions in the Matuyama. Furthermore, average climatic conditions during the Matuyama were slightly cooler in the Southern Ocean than during the Brunhes. This conflicts with a previously established Southern Ocean climatic curve based on radiolarian frequency changes. The disappearance of the present-day temperate radiolarian species, Saturnulus planetes and Pterocanium trilobum, at the Brunhes-Matuyama boundary within Subantarctic-northern Antarctic waters was possibly due to a loss of environmental tolerance to Subantarctic-northern Antarctic conditions. The most conspicuous horizon of biostratigraphic change within the last 2.43 m.y. is at the Brunhes-Matuyama boundary where at least two radiolarian species and one foraminiferal species disappear and two foraminiferal species appear. The extinction of several radiolarian species takes place close to magnetic reversals.

E-11500
Stipanicic, P.N. , Toubes, R.O., Spikermann, J.P., Halpern, M.
COMPOSITION AND AGE OF SOME PLUTONIC ROCKS FROM THE NORTHEAST SECTOR OF THE PROVINCE OF SANTA CRUZ, PATAGONIA (ARGENTINA). Sobre la composición y edad de algunas plutónitas del nordeste de la Provincia de Santa Cruz, Patagonia (Rep. Argentina). Asociación Geológica Argentina. Revista, Oct.-Dec. 1971 26(4), p.459-467. In Spanish with English summary. 26 refs.
QE1.A7213

The Triassic age obtained by the Rb/Sr method of several samples of biotite from granitic rocks from the Deseado "Massif" (Province of Santa Cruz) is given, and the geological significance of this age is discussed. (Auth.)

E-11510
Bardin, V.I.
GEOMORPHOLOGICAL OBSERVATIONS IN THE HUMBOLDT MOUNTAINS AND PETERMANN RANGE.
Geomorfologicheskie nabliudeniia v gorakh Gumbol'dta i Peterman. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.229-234. In Russian. 4 refs.
G860.S63

As a result of geomorphological studies of the Humboldt Mts. and Petermann Range by the geological and geographical group of the 12th Soviet Antarctic Expedition in 1967, a map at 1:200,000 scale was compiled. Major mountain crests of the areas represent horsts, and box-like valleys, covered with glaciers, indicate grabens. In addition to submeridional faults, the tectonic shift of sublatitude trends, which divide mountain crests in a row of separate massives, are described. Two types of the relief, disrupted (periglacial) and flat-apical (glacial), occurring in the areas, are discussed.

E-11523
Clark, R.
PERIGLACIAL LANDFORMS AND LANDSCAPES IN THE FALKLAND ISLANDS. Biuletyn peryglacjalny, 1972 No.21, p.33-50. 16 refs.

Landforms and the erosion system of the Falkland Islands are discussed and relationships between the various parts are established. Hilltops are characterized by blockfields, altiplanation surfaces and residual tors; hillsides by frost-riven crags, scree, block-terraces, and stoneruns. Valleys are largely encumbered by stoneruns and head, the latter also forming extensive sheets on the lower ground. Evidence of the consequences of severely cold climate is extended by the description of a number of corries (cirques) in the highest and most extensive uplands, of thaw lakes and depressions, and of patterned ground. Amelioration of climate led to the formation of smaller debris terraces after the larger block-terraces ceased to develop. There is evidence that since the periods of most severe cold rivers continued to discharge much greater volumes and loads than they now do. That the phases of severe and declining cold were not a simple progressive sequence is shown in the interbedding of organic and mineral deposits noted from

coastal exposures. Terrestrial deposits extend below present sea-level and drowned valleys are traceable to depths well within those possible during the last major glacio-eustatic withdrawal of sea. Coastal materials show that the climate was still subject to significant fluctuations at the time of recovery to present level. The present climate appears to be one of much reduced morphological activity with little frost action; rivers are generally sluggish and underfit. Both worldwide and especially regional circumstances concerned in producing the local cold conditions are considered. The degree of cooling adequate to produce an environment rigorous enough to form the landforms was very similar to that for British and continental European periglacial phenomena.

E-11527
Grishankov, G.E.
LANDSCAPE LEVELS OF THE CONTINENTS AND GEOGRAPHIC ZONING. Landshaftnye urovni materikov i geograficheskaia zonal'nost'. Akademiia nauk SSSR. Izvestiia. Seriia geograficheskaia, July-Aug. 1972 No.4, p.5-18, In Russian. 42 refs.

Patterns of geographic zoning of the continents based on a three-dimensional landscape model conform to 4 groups: 1) outer glacial, 2) outer pre-glacial (sub-arctic and sub-antarctic belts and high-mountain regions of temporate, subtropical and tropical belts), 3) inner land (temporate, subtropical and tropical belts without high-mountain regions), and 4) oceanic group. Geomorphological data for the first three groups are graphed and discussed. The outer glacial group includes continental ice and long-term sea ice of the Arctic and Antarctic with radiation balance from 0 to -11.6 kcal/sq cm and elevations from 0 to 4500 m. According to Markov et al (see E-8979) the outer glacial group is divided into an oceanic zone with permanent drifting sea ice and a continental ice zone.

E-11542
Smithson, S.B. , Fikkan, P.R., Houston, R.S.
AMPHIBOLITIZATION OF CALC-SILICATE METASEDIMENTARY ROCKS. Contributions to mineralogy and petrology, 1971 Vol.31, p.228-237, 24 refs.

Diopside granofels layers are associated with other metasedimentary rocks and gneisses near McMurdo Sound. Disrupted diopside granofels layers form tectonic inclusions which may have reaction rims of amphibolite. This amphibolite may either be a typical hornblende-plagioclase amphibolite or a hornblende-quartz amphibolite according to the initial composition of the diopside granofels. Chemical analyses of the reaction rims show that some of the amphibolites have major element compositions near tholeiitic basalt but that a sedimentary origin could be recognized for others that are high in silica. During amphibolitization, the diopside granofels loses Ca and gains Fe and Mg by mutual exchange of material with surrounding rock over short distances. The metasomatic amphibolites fall on the "igneous differentiation trend" in a Niggli mg-c plot. At least small volumes of metasedimentary rock can attain the composition of basalt by amphibolitization in a metasomatic reaction rim. (Auth.)

E-11577
Montgomery, G.E.
AEROMAGNETIC SURVEYS OF THE ROSS ISLAND AND TAYLOR GLACIER QUADRANGLES. Antarctic journal of the United States, July-Aug. 1972 7(4), p.90-91, 3 refs.
G845.A56

An aeromagnetic survey of the dry valley area was made during the 1971-1972 field season as part of the Dry Valley Drilling Project. Approximately 50 percent of the 12,000 km of flight line has been completed. Until the data have been corrected and a magnetic contour map of the region constructed, only a qualitative interpretation can be stated.

E-11578
Clark, C.C.
SEISMIC REFRACTION AND ELECTRICAL RESISTIVITY INVESTIGATIONS IN THE DRY VALLEYS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.91-92, 3 refs.
G845.A56

Electrical depth sounding and seismic refraction profiling was conducted in the dry valleys during the 1971-72 austral summer as part of the Dry Valley Drilling Project. It was assumed that where sediments and bedrock had high resistivities (greater than 10,000 ohm-m), confining permafrost was definitely present. Where unfrozen surface material was present, especially near saline lakes, resistivities at depth were generally less than 500 ohm-m. Compressional wave velocities ranged from below 1,600 m/sec for unfrozen, unconsolidated material to over 6,000 m/sec, probably indicating frozen granitic basement. Lab measurements of electrical and seismic properties of antarctic soils, rocks, and waters at various temperatures and pressures are in progress.

E-11581
Rorii, T.
JAPANESE FIELD PARTY SURVEYS IN THE DRY VALLEYS OF ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.96
G845.A56

Japanese field parties carried out electrical depth soundings in the dry valley region during Dec. 1971 and Jan. 1972. Preliminary analysis of field data indicates that a stratum of relatively low resistivity may be present under the high-resistivity permafrost stratum in many places. Preliminary results of studies on the heat budget and geochemistry of Lake Vanda indicate that during the summer only 7 percent of the solar radiation penetrates the ice, while reflection, internal melting, evaporation, and back radiation account for the rest. In addition, the highest temperatures near the bottom seem to have been decreasing over the past 10 yr.

E-11582
Webb, P.N.
PALEONTOLOGY OF LATE TERTIARY-QUATERNARY SEDIMENTS, WRIGHT VALLEY, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.96-97
G845.A56

Paleontological studies in the Wright Valley during the 1971-72 field season focused on the stratotype of the Pecten Glaciation. The following conclusions were drawn from preliminary studies: 1) The deposits of the Pecten Glaciation stratotype are in situ marine sediments containing an assemblage of relatively shallow water taxa. 2) The argument that the Pecten gravels were deposited in a glaciofluvial environment is rejected, as is the existence of a Pecten Glaciation. Sediments were deposited in interglacial or near interglacial conditions. 3) Following the major phase of glacial dissection

of Wright Valley a marine incursion converted it [illegible] 4) Glaciomarine sediment brought about a [illegible] of marine waters from the valley. 5) The Pecten gravels and the Scallop Hill Formation of Black and White Is. are correlatives. 6) Isotope dating indicates that the Pecten gravels and Scallop Hill formation are not older than late Pliocene (3.4 to 3.9 m.y.) and the shell material of Chlamys tuftsensis is no younger than 800,000 yr.

E-11583
Nelson, C.S. , Wilson, A.T.
BATHYMETRY AND BOTTOM SEDIMENTS OF LAKE VANDA, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.97-99, 3 refs.
G845.A56

To assist in locating the best site for the Lake Vanda drill hole, the nature of the bottom surface sediments was studied for the purpose of constructing a general bathymetric map of the lake. A maximum depth of 68.6 m is recorded near the center of the western lobe of the lake. Lake bottom sediments sampled at 25 drill holes show two contrasting bottom sediment facies. Shallower than 60 m the environment is aerobic, consisting mainly of pale fawn and quartzofeldspathic sands, overlain by a layer of biological detritus containing algae, diatoms, fungal mycelia, bacteria, and terrigenous sand. Below 60 m the environment is anaerobic, the sediments consisting of sandy muds and muddy sands rich in finely disseminated organic matter. The bathymetric map is shown.

E-11587
McSaveney, E.R. , McSaveney, M.J.
ANCIENT ICE WEDGES IN WRIGHT VALLEY, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.102-103, 2 refs.
G845.A56

Completely exposed cross sections of ice wedges were recorded for the first time in Wright Valley. Three complete sections were observed in a single 2-m-high, 25-m-long exposure in a freshly cut terrace wall along the south bank of Onyx River alluvium. The largest wedge measured 106 cm deep and 23 cm at its widest point. The ice wedges are described and their surroundings and approximate ages discussed. The wedges are no longer active, being totally deprived of a viable moisture source.

E-11588
Mayewski, P.A.
GLACIAL GEOLOGY NEAR MCMURDO SOUND AND COMPARISON WITH THE CENTRAL TRANSANTARCTIC MOUNTAINS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.103-106, 9 refs.
G845.A56

Work begun in 1970-1971 at McGregor and Amundsen Glaciers was extended during Dec. 1971 and Jan. 1972 into the ice-free areas between Mount Feather and Convoy Range. Transport and reconnaissance were supplied by VXE-6 helicopters. The principal objective of the 1971-1972 season involved searching for a semilithified till equivalent to the Sirius Formation. Five outcrops of the till in the McMurdo region were found that are believed to be equivalent to the Sirius Formation of the central Transantarctic Mountains. The results indicate three systems of lateral moraines in the central Transantarctic Mountains differentiated by the degree of weathering of surficial boulders, by the degree of soil development and by their elevations: (from oldest to youngest) the high, middle and the low moraines. The low moraines of the Shackleton, Amundsen, and Scott Glaciers include deposits up to 30 m above the present ice surface. The long profiles of the high and middle moraines roughly parallel present ice slopes from the heads of the glaciers to within 65 to 80 km of the Ross Ice Shelf, but then flatten markedly toward the coast. The flattening may imply grounding of the Ross Ice Shelf. Thus, evidence suggesting that the Ross Ice Shelf was grounded exists in the McMurdo region and in the central Transantarctic Mountains. The latter provide evidence for the synchrony between the grounding effects noticed in the profiles of the lateral moraines and the thickenings of the plateau ice.

E-11589
Borns, H.W., Jr. , Hall, B.A., Ball, H.W., Brooks, H.K.
MAWSON TILLITE, VICTORIA LAND, EAST ANTARCTICA: REINVESTGATION CONTINUED. Antarctic journal of the United States, July-Aug. 1972 7(4), p.106-107, 4 refs.
G845.A56

A study of the origin and age of the Mawson Tillite (?) begun in 1968-1969 was continued in 1971-1972 at Carapace Nunatak in the Transantarctic Mountains of southern Victoria Land. The primary objective was to describe the fauna and flora of a Jurassic pond deposit, and ascertain the paleoenvironment and age of this fossil locality. Fossils known to be represented are conchostracans, notostachans, isopods, ostracods, syncarids, insects and plants. On the basis of comparison with coeval volcanic beds, the pond deposits of the nunatak have been assigned a mean absolute of 156 m.y. near the base of the Upper Jurassic.

E-11590
Sublett, A.G. , Hauck, W.C., Houston, R.S., Smithson, S.B.
BASEMENT GEOLOGY OF MOUNT INSEL AREA, VICTORIA VALLEY, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.107-108
G845.A56

Metamorphic basement rocks of the east flank of Mount Insel in Victoria Valley, mapped during the 1971-1972 field season, are calc-silicate schist and gneiss, marble, and quartzo-feldspathic gneiss. Mineral assemblages containing garnet in the quartzo-feldspathic gneiss; sillimanite coexisting with K-feldspar, and lack of muscovite in pelitic schist place these rocks in the upper- amphibolite metamorphic facies. Blue-gray graphite bands and red-orange chondrodite layers define easily visible folding of the Mount Insel area. Three fold periods are distinguished and described. The basement rocks are highly dissected by a series of igneous rocks. Three general composition of dikes are encountered: felsic, intermediate, and mafic. Faults and trends along them are discussed.

E-11594
Jacobini, F.C. , Anderson, D.M.
IONIC MIGRATION IN FROZEN ANTARCTIC SOIL. Antarctic journal of the United States, July-Aug. 1972 7(4), p.112-113, 2 refs.
G845.A56

Experiments were set up to monitor the movement of chlorine-36 and sodium-22 chloride in cold dry soils of the lower Wright Valley in the summers of 1968 and 1969-1970 respectively to establish whether 1) ionic migration takes place

and 2) liquid films of water surrounding the minerals do exist. It was found that the negatively charged ions (chlorine-36) had moved 7 cm above the emplacement point after 25 days, while at the similar site, the positively charged ions (sodium-22) had moved a maximum distance of 5 cm in 2 years. The hydrothermal regime, measured during November for 1962, 1968, 1969, and 1971, has remained constant. The discrepancy of migration of opposite charged ions is explained on the basis of their charges. The study shows that minerals are surrounded by a film of unfrozen water and that weathering of silicates can be explained as a presently continuing phenomenon. During warmer and moister periods, the thickness of the film of unfrozen water should increase and thus increase the mobility of the ions.

E-11595
Morris, E.C. , Holt, H.E., Mutch, T.A., Lindsay, J.F.
MARS ANALOG STUDIES IN WRIGHT AND VICTORIA VALLEYS, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.113-114
G845.A56

Geological investigation was made of the ice-free valleys of southern Victoria Land during the 1971-1972 field season to obtain data for comparative analysis with pictures to be returned from the Viking Mars mission in 1976, since surface features, common in the land, may also occur on Mars. Nearly 1,300 black-and-white and color photographs were taken of various geologic features in Victoria and Wright Valleys. Samples and cores were taken of the summer and frozen winter dune beds for laboratory study.

E-11596
Anderson, D.M. , Gatto, L.W., Ugolini, F.C.
ANTARCTIC ANALOG OF MARTIAN PERMAFROST TERRAIN. Antarctic journal of the United States, July-Aug. 1972 7(4), p.114-116, 2 refs.
G845.A56

Identification of analogous regions on Mars and the Earth can be of significant benefit in the design of the instrumentation and mission of Martian orbiters and landers. Based on studies of Mariner 6 and 7 imagery, the thermokarst topography of Yakutia (Siberia) is considered a possible genetic analog to "chaotic terrain" of Mars. The edges of the ice caps near Thule (Greenland) and in the Beacon Valley (Antarctica) are regarded as analogs to regions bordering the polar caps of Mars. Beacon Valley is considered the most apt analogy. Because snow accumulation is negligible and ablation occurs mainly by sublimation, liquid water there, as on Mars, is an ephemeral phase. Chemical weathering clearly is occurring, albeit slowly, and mechanical weathering and frost action are significant. Interpretation of the aerial photographs of Beacon Valley site taken from 6,250 m is given in detail.

E-11614
Govorukha, I.S.
LANDSCAPES ASSOCIATED WITH VARIOUS TYPES OF ICE COVER. Landshaftnoe polozhenie i differentsiatsiia lednikovykh pokrovov. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.304, p.85-103, In Russian. 22 refs.
G600.L4

Data obtained previously by Russian scientists on the structure and classification of glacial landscapes in the Arctic and Antarctica were studied. The natural boundaries of landscape subdivisions within an ice cover are discussed.

E-11616
Aleksandrov, M.V. , Simonov, I.M.
SUBDIVISION OF THE MOLODEZHNAYA LOWLAND-OASIS LANDSCAPES IN EAST ANTARCTICA. Vnutrilandshaftnoe delenie nizmennykh oazisov vostochnoi Antarktidy (na primere oazisa Molodezhnogo). Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.304, p.210-228, In Russian. 15 refs.
G600.L4

The morphology of landscapes of lowland oases and classification of some periglacial landscapes in Antarctica were studied. The main feature of antarctic oases is the presence of lakes which never freeze through. From a regional point of view, single lowland oases form a landscape. According to morphological structure, lowland-oasis landscapes are comparatively simple: facies--well-delineated area--district-subdistrict. Classification of antarctic oases and their morphology requires detailed landscape mapping.

E-11620
Kemp, E.M.
REWORKED PALYNOMORPHS FROM THE WEST ICE SHELF AREA, EAST ANTARCTICA, AND THEIR POSSIBLE GEOLOGICAL AND PALEOCLIMATOLOGICAL SIGNIFICANCE. Marine geology, Oct. 1972 13(3), p.145-157, 34 refs.
QE39.M3, DGS 530 M3

Glacial marine sediments in the vicinity of the West Ice Shelf, East Antarctica, contain abundant recycled spores, pollen and microplankton. Analysis of the reworked spore and pollen aggregates in terms of the known ranges of constituent species indicates that they derive from the erosion of Permian, Lower Cretaceous, and uppermost Cretaceous to Lower Tertiary strata. The microplankton component suggests that the Eocene part of the eroding sequence was deposited under marine conditions. Physical and geological considerations suggest that a source for the recycled material lies somewhere in the West Ice Shelf- Prydz Bay area. The presence of pollen of probable Eocene age in this part of East Antarctica is of palaeoclimatological interest, suggesting that forest cover existed in the region at that time. Previous studies have indicated that parts of West Antarctica were vegetated during the same interval. Such evidence for widespread vegetation cover is not compatible with ice-sheet development to continental proportions during the Eocene. (Auth.)

E-11632
Heywood, R.B.
ANTARCTIC LIMNOLOGY: A REVIEW. British Antarctic Survey. Bulletin, Aug. 1972 No.29, p.35-65, Numerous refs.
QH84.2.B72

Information on Antarctic inland waters is presented against a background of historical, geographical, topographical, geological and climatic detail because of prevailing widespread ignorance about Antarctica in general. Present knowledge suggests that aridity is the most important climatic factor determining the variety of lake and pool environments in Antarctica. Comparison with Arctic inland waters indicates that the considerably poorer biota of Antarctica largely reflects the isolation and the youth of

the ecosystem. The review clearly reveals the need for basic, comprehensive research programs in all areas of the continent. (Auth.)

E-11633
Brook, D.
STRATIGRAPHY OF THE THERON MOUNTAINS. British Antarctic Survey. Bulletin, Aug. 1972 No.29, p.67-89, 43 refs.
QH84.2.B72

The oldest rocks exposed in the Theron Mountians comprise 700 m. of terrestrial, water-laid clastic sediments consisting of arkosic, feldspathic and quartzitic fine-grained sandstones and siltstones with thin shales and mudstones, and subordinate carbonaceous beds and coals. Minor hiates may represent variations within the depositonal environment. A glossopterid flora indicates a Lower Permian age. These sediments were intruded by great thicknesses of Jurassic dolerite. The occurrence of minor local tilting and faulting was associated with and subsequent to intrusive activity, and pervasive thermal metamorphism of most of the sediments occurred. Post-Jurassic tectonic activity is not known but some block faulting may have elevated the Theron Mountains. (Auth.)

E-11635
Horne, R.R. , Thomson, M.R.A.
AIRBORNE AND DETRITAL VOLCANIC MATERIAL IN THE LOWER CRETACEOUS SEDIMENTS OF SOUTH-EASTERN ALEXANDER ISLAND. British Antarctic Survey. Bulletin, Aug. 1972 No.29, p.103-111, 15 refs.
QH84.2.B72

Unusual structures in the Lower Cretaceous shallow-water marine sediments of Alexander I. are described and interpreted as being altered material of direct aerial introduction from a volcanic source. Volcanogenic material derived from syndepositional lavas and tuffs to the east is also described. (Auth.)

E-11636
Smithson, S.B.
GRAVITY INTERPRETATION IN THE TRANS-ANTARCTIC MOUNTAINS NEAR MCMURDO SOUND, ANTARCTICA. Goelogical Society of America. Bulletin, Nov. 1972 83(11), p.3437-3442, 21 refs.
QE1.G2

The broad structure of the Trans-Antarctic Mountains has been interpreted to be a horst, a monocline, or an anticline. Gravity measurements show that a negative Bouguer gravity anomaly of 130 mgal follows the mountains and a maximum gravity gradient of 7 mgal/km is found along the west side of McMurdo Sound. Surface faults cannot explain the high gravity gradient, and a deep fault or step in the Moho causes a gradient that is too small. The gravity anomaly is satisfied by a shallowing of the Moho from 40 km under the Trans-Antarctic Mountains to 28 km under McMurdo Sound, and by a shallow, dense 8-km-thick slab under McMurdo Sound. This suggests that the crust in West Antarctica is thinner and more dense than in East Antarctica. The Antarctic continent may have formed by fusing together of two continental plates along an early Paleozoic subduction zone. (Auth.)

E-11652
Northern Illinois University. Department of Geology
DRY VALLEY DRILLING PROJECT; BULLETIN NO.1. BOREHOLE NO.1 ON ROSS ISLAND. Dec. 1972, 90p. + map, Numerous refs. Total Intensity Aeromagnetic Map Of the Taylor Glacier Ross Island Quadrangles, Antarctica. Scale 1:250,000.

The Dry Valley Drilling Project (DVDP), initiated during the 1971-72 field season with airborne and surface geological, geophysical and microbiological reconnaissance studies, is the first of several drilling projects now planned. Drilling is scheduled to begin in late January of 1973 and will continue through successive field seasons until its termination in February of 1975. Because of the diverse geological record of the McMurdo Sound region and the fact that the region may straddle the ancient suture between east and west Antarctica, the retrieval of continuous, hard rock, and sedimentary core will permit a detailed reconstruction of an unknown period of antarctic history, which in turn played a critical role in global history. A minimum of ten boreholes are presently scheduled, one on Ross Island, one in McMurdo Sound (using sea-ice as a platform), and the remainder to be drilled in the Dry Valley area. Programs to be conducted during the course of the project include geological, geochemical, geophysical, and biological analyses of rocks and soils, borehole geophysical logging, hydrogeological analyses and an array of interrelated surface and airborne studies. The bulletin summarizes the scientific plan and contains 16 papers on the proposed studies for 1972-73 and regional and site studies of 1971-72. (Auth. mod.)

E-11653
Cole, J.W. , Kyle, P.R.
STRATIGRAPHY, PETROLOGY AND CHEMISTRY OF ROCKS FROM ROSS ISLAND DRILL-HOLE. Dry Valley Drilling Project (DVDP). Bulletin, Dec. 1972 No.1, p.8-10

The objectives of this study are to interpret the eruptive history of the McMurdo Volcanics around McMurdo Base and compare this interpretation with that already made by Cole and Ewart from outcrops in the McMurdo Sound region. To facilitate this study, detailed petrographic and mineralogic examination of the lavas would be necessary. For critical samples in the retrieved core, major and trace element analyses of the rock and mineral constituents would have to be made. Continuing and future proposed work is summarized.

E-11654
Browne, P.R.L.
HYDROTHERMAL ALTERATION OF ROCKS FROM DRILLHOLES ON ROSS ISLAND AND IN MCMURDO SOUND. Dry Valley Drilling Project (DVDP). Bulletin, Dec. 1972 No.1, p.11-12

Objectives of this proposal are: (a) to study the hydrothermal alteration (if any) of cores from drillholes with a view to learning of past or present subsurface fluid movement, composition, and temperatures. This would give information about the geothermal potential of Ross Island; and, (b) to compare the alteration in drillholes with alteration of surface samples collected from Mt. Erebus by P. R. Kyle in 1971 and further samples to be collected by Browne during November-December, 1972.

E-11655
Spall, H.
PALEOMAGNETIC STUDIES OF ROCKS DRILLED DURING DVDP. Dry Valley Drilling Project (DVDP). Bulletin, Dec. 1972 No.1, p.19-20

Paleomagnetic interests in DVDP are twofold. First, the Ross Island lavas and Holocene

lakebeds will enable investigation of Recent magnetic reversal stratigraphy. The value of this will be increased if the polarity sequences can be correlated with data from sediment core obtained from JOIDES Legs 28 and 20 proposed for the Ross Sea. The second paleomagnetic interest is in Phanerozoic rocks drilled in South Victoria Land. If the azimuth of the bulk core can be obtained, a determination can be made of pole positions from surface rocks and make a contribution to the Paleozoic pole path for Antarctica.

E-11656
Webb, P.N.
LATE CENOZOIC FORAMINIFERA AND STRATIGRAPHY IN SEDIMENTS OF THE MCMURDO SOUND AREA. Dry Valley Drilling Project (DVDP). Bulletin, Dec. 1972 No.1, p.22-24

Objectives of this proposal are to study foraminifera and other microfossils from marine sediments interbedded with McMurdo Volcanics on southern Ross Island with a view to: (a) correlation with the glacial/interglacial stratigraphy of the dry valleys, particularly Wright and Taylor Valleys; (b) correlation with the glacio-marine stratigraphy of the Ross Sea area; (c) improve knowledge of marine biostratigraphy in the McMurdo Sound area prior to drilling in the dry valleys later in the Dry Valley Drilling Project.

E-11657
Burns, D.A.
CENOZOIC CALCAREOUS NANNOFOSSILS AND STRATIGRAPHY OF SEDIMENTS IN THE MCMURDO SOUND AREA. Dry Valley Drilling Project (DVDP). Bulletin, Dec. 1972 No.1, p.24-26

The objective of this study is to determine whether the marine sediments interbedded with the McMurdo Volcanics on Southern Ross Island contain calcareous nannofossils with a view to: (a) determining if calcareous nannoplankton occur in such high latitudes; (b) correlation of nannofossils biostratigraphy with the glacio-marine stratigraphy of the Ross Sea area, as shown by forams; (c) to determine the calcareous nannoplankton biostratigraphy in the McMurdo Sound area prior to drilling in the Dry Valleys later in the DVDP; (d) to correlate these sequences with those drilled by the Glomar Challenger on Leg 28 DSDP in the Ross Sea and nearby areas; (e) to determine the presence and extent of any paleoclimatic fluctuations which have occurred in the area during its marine history.

E-11658
McGinnis, L.D. , Nakao, K., Clark, C.C.
GEOPHYSICAL INDENTIFICATION OF FROZEN AND UNFROZEN GROUND, ANTARCTICA. Dry Valley Drilling Project (DVDP). Bulletin, Dec. 1972 No.1, p.30-60, 21 refs.

Field electrical and seismic studies on permafrost in the Dry Valleys of the McMurdo Sound region were conducted in preparation for the Dry Valley Drilling Project. To establish criteria for identification of subsurface materials, curves of temperature vs. velocity and temperature vs. resistivity were determined for selected samples in the laboratory through the temperature range +24 deg C to -76 deg C. A plot of porosity vs. percent velocity increase during freezing is linear for porous, saturated material. Both resistivity and velocity are nearly constant over a wide temperature range for dry or non-porous materials. From field studies made in conjunction with laboratory analyses it is concluded that frozen ground in the Dry Valleys is discontinuous, being non-existent beneath saline lakes and as thick as 1000 meters in the uplands. One small saline lake, Don Juan Pond, is underlain by lacustrine sediment up to 55 meters thick and remains unfrozen throughout the year. Other lakes, although frozen in the upper few meters, contain warm, laminated, and solar heated brines that are not underlain by permafrost. Only one lake, Lake Vida, appears to be frozen to the bottom. The presence of surficial, confining permafrost in most regions of the Dry Valleys prevents accurate analyses of subsurface conditions using seismic refraction techniques; however, the use of complementary electrical studies does permit an interpretation to be made below the high velocity layer. (Auth. mod.)

E-11659
McGinnis, L.D. , Montgomery, G.E.
AEROMAGNETIC RECONNAISSANCE AND GEOLOGIC SUMMARY OF THE DRY VALLEY REGION. Dry Valley Drilling Project (DVDP). Bulletin, Dec. 1972 No.1, p.61-90, Refs. p.84-88.

Aeromagnetic coverage for DVDP related studies is approximately 40 percent completed. Ross Island and the Dailey Islands are associated with high intensity (>500 gamma), short wave length (about 5 km) anomalies which indicate localized, multiple extrusive centers of both normal and reversed polarities. Only Mt. Erebus, of the four large volcanic peaks on Ross Island, is associated with a single, broad magnetic high, nearly 3000 gamma over the regional field. Total field intensity over Mt. Erebus at elevation 300 meters above the surface is 68,000 gamma . McMurdo Sound and the continental shelf east of Hut Point Peninsula, except for isolated centers of magnetic maxima and minima, such as the Dailey Islands, are associated with a broad, undulating field having a total magnetic relief of 700 gamma . The Dry Valleys in the Transantarctic Mountains are non-magnetic; however, the adjacent uplands which are intruded by the massive, Ferrar Dolerite sills are associated with anomalies of 500 to 600 gamma . The anomalies are caused by the normally polarized sills which continue, at least to the extent of westward exploration, under the East Antarctic ice-sheet. Small, localized centers of Cenozoic extrusive rocks mapped in the valleys are not associated with magnetic fields of sufficient strength to be observed using the surveying techniques of the present study. (Auth. mod.)

E-11663
LeMasurier, W.E.
MARIE BYRD LAND QUATERNARY VOLCANISM: BYRD ICE CORE CORRELATIONS AND POSSIBLE CLIMATIC INFLUENCES. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.139-141, 4 refs. G845.A56

Published petrographic descriptions of the volcanic ash bands in the Byrd Station deep drill core (Gow, 1971; E-10325, and Gow and Williamson, 1971; F-10462) have suggested some sources for ash among the volcanoes in Byrd Land and some possible climatic implications of this volcanism. The available petrographic and age data on volcanoes that are known to have erupted in Byrd Land in Quaternary time - Mt. Murphy, Toney Mountain, Mt. Takahe, and Mt. Waesche - suggest that Mt. Waesche and Mt. Takahe were the major sources of ash. Events recorded in the core occurred within the last 75,000 yr. The most distinctive petrographic characteristics of the

Quaternary volcanic rocks are the abundance of olivine, plagioclase, and titanaugite phenocrysts in the basalts, and of alkali feldspar and aegerine phenocrysts in the acid rocks.

8-11664
[illegible]
GEOLOGY OF THE ROSS ISLAND AREA, ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.141, 9 refs.
G845.A56

[illegible] data from specimens collected in the Ross Island area indicate that each major [illegible] of the area [illegible] an older sequence of lavas that range from olivine basalt to trachyte and a younger sequence that consists of olivine basalt and basalt. There is some evidence that the older sequence may have been repeated in some areas.

8-11665
Colbert, E.H.
ANTARCTIC TRIASSIC TETRAPODS IN THE LABORATORY. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.141-142
G845.A56

A number of Lower Triassic amphibians and reptiles have been collected from the Fremouw Formation, Coalsack Bluff, and McGregor and Shackleton Glaciers, and illustrated by means of line drawings in preparation for detailed study. It is already apparent that the Lower Triassic tetrapods of Antarctica have remarkably close resemblances to fossils from the Middle Beaufort beds of South Africa.

8-11666
Jones, L.M. , Walker, R.L.
GEOCHEMISTRY OF THE MCMURDO VOLCANICS, VICTORIA LAND. PART 1. STRONTIUM ISOTOPE COMPOSITION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.142-144, 2 refs.
G845.A56

Current results of strontium isotope analyses of the McMurdo volcanics from Victoria Land and selected volcanics from the southern Transantarctic Mountains and West Antarctica are given. The average Sr-87/Sr-86 ratio for 45 analyzed samples from Victoria Land is 0.7038 plus or minus 0.0001. This value is similar to that of basaltic rocks from oceanic areas.

8-11667
[illegible]
GEOLOGIC SURVEY OF MARIE BYRD LAND. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.144-145, 7 refs.
G845.A56

Based on detailed studies of rock specimens and field data, the sequence of events comprising the geologic history of Marie Byrd Land has been determined as follows: 1) deposition of a thick sequence of marine sediments in a subsiding basin during late Precambrian-early Paleozoic time; 2) intense folding and metamorphism of the sediments in late Ordovician time; 3) intrusion of large granodioritic plutons in mid-Paleozoic time in the northern Ford Ranges; 4) intrusive igneous activity during the late Paleozoic farther to the east in the Kohler Mountains, Bakutis Coast sector; 5) widespread intrusions of granitic plutons during the Cretaceous; and 6) periodic eruptions of alkali basalt and pyroclastics in the Cenozoic period. No geologic processes other than erosion have been noted during the Triassic and Jurassic periods.

8-11668
Williams, P.L. , Rowley, P.D.
COMPOSITION OF JURASSIC SANDSTONES, LASSITER COAST. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.145-146, 6 refs.
G845.A56

The sandstone composition of the Latady Formation of Late Jurassic age in the Lassiter Coast and the Trinity Peninsula Series of Carboniferous (?) age is markedly different. The Lassiter Coast sandstones, with few exceptions, are lithic and contain an abundance of rock fragments with lesser amounts of quartz, feldspar, and quartz-sericite matrix. The Trinity Peninsula series sandstones are arkoses and contain much more feldspar than rock fragments. The two units are similar in appearance, and comparison of sandstone composition is the most useful method for distinguishing between the two.

8-11669
Cortes, D.M.
GEOLOGIC MAPPING IN THE CENTRAL TRANSANTARCTIC MOUNTAINS: A PROGRESS REPORT. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.146, 3 refs.
G845.A56

Reconnaissance geologic maps of the Mt. Elizabeth-Mt. Kathleen and Buckley I. quadrangles were completed in the last year with publication scheduled for 1972 and 1973, respectively. Other maps in various stages of preparation include the Plunket Point, the Cloudmaker, Mt. Goodale, and Nilsen Plateau quadrangles.

8-11670
Breed, W.J.
WHY IS BLACK ISLAND BLACK AND WHITE ISLAND WHITE?. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.146-147
G845.A56

Black I., so named for its black volcanic rocks, and White I., for its mantle of snow, are prominent features of volcanic origin on the southern horizon as viewed from McMurdo Station. The answer to why one is white and the other black lies in their geographic positions. Black I. is directly north of Minna bluff (elev. 1,060 m) and does not get much blown snow, while White I. has nothing to the south of it but open ice shelf which favors the collection of snow.

8-11671
Ford, A.B. , Nelson, S.W.
DENSITY OF THE STRATIFORM DUFEK INTRUSION, PENSACOLA MOUNTAINS, ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.147-149, 13 refs.
G845.A56

The Dufek intrusion, an immense layered gabbroic complex, was mapped in entirety, geophysically surveyed, and extensively sampled in the austral summer of 1965-1966. The results of field data analyses and laboratory studies of samples since that time are briefly summarized. Parts of the intrusive body are exposed in enormous escarpments that provide two complete sections for study: a lower one, 2 km thick, in the Dufek Massif, and an upper one, also about 2 km thick, in the Forrestal Range. Densities measured on approx 600 samples range widely from as low as 2.65 g/cc for granophyre and 2.70 g/cc

for anorthosite to as much as 3.30 g/cc for pyroxenite and 3.50 g/cc or more for magnetite. Most gabbros lie in the 2.80-3.20 g/cc range. The average density of the Dufek Massif section is about 2.95 g/cc; that of the Forrestal Range section, about 3.03 g/cc. The estimated average for the entire body approximates 2.98 g/cc. An upward increase in average density reflects the strong trend of iron enrichment during fractional crystallization of the Dufek magma.

E-11672
Halpern, M.
RB-SR AND K-AR DATING OF ROCKS FROM SOUTHERN CHILE AND WEST ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), University of Texas at Dallas. Geosciences Division. Contribution No.216, p.149-150, 5 refs.
G845.A56

Rb-Sr and K-Ar dates of igneous and metamorphic rocks from southern Chile and plutonic rocks from West Antarctica are given. Gneisses from the basement of the Magellan Basin at the Atlantic entrance to the Strait of Magellan have been Rb-Sr total rock dated at 306 plus or minus 156 m.y. with an initial Sr-87 to Sr-86 ratio of 0.7112 plus or minus 0.0033. Igneous rocks of the Chilean Andrean intrusive suite of the Patgonian batholithic complex range in age from Jurassic to Tertiary. Radiometric dates from West Antarctica are limited in number.

E-11673
Dalziel, I.W.D.
STRUCTURAL STUDIES IN THE SCOTIA ARC: ISLA DE LOS ESTADOS, ARGENTINA. R/V HERO CRUISE 72-2. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.151-152, 10 refs.
G845.A56

R/V Hero sailed from Punta Arenas, Chile on Apr. 25, 1972 and returned to Rio Gallegos, Argentina on June 1, 1972. Twenty-nine days were spent working on Isla de los Estados and four at the eastern end of Isla Grande, Tierra del Fuego, in an attempt to correlate the lithic units and geologic structure across the Strait of Le Maire. Extensive collecting was undertaken and lithologic and structural maps were prepared.

E-11674
Shultz, C.H.
PETROLOGY OF DECEPTION ISLAND VOLCANO. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.152-153, 3 refs.
G845.A56

Work on this project during the past year has consisted of evaluating field observations, petrographic data, and chemical analysis. Petrographic work has been concentrated on the pre-1967 pyroclastics, tuffs, and breccias. A sample of the volcanic ash that fell on the Soviet Bellingshausen Station after the eruption of Aug. 12, 1970 compares favorably petrographically, with mechanically analyzed tephra collected on Deception I. Chemical data indicate that Deception I. rocks belong to the oceanic basalt-trachyte association, although the match is imperfect.

E-11675
Lander, J.F.
CIRCUMANTARCTIC SEISMICITY IN 1971. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.153-154
G845.A56

A total of 107 hypocenters were located south of 45 deg S latitude during 1971, bringing the total since 1958 to 1,382. Hypocenters for all events in 1971 were published at shallow depths of foci, 33 km or less, except for some in the South Sandwich Is. region, 7 of which were published at intermediate depths from 60 km to a maximum of 183 km. The seismicity of the circumantarctic belt for 1970 and 1971 is similar. A major shock on Feb. 8 was the fifth of a series of shocks at Deception I. beginning in 1967. The event was felt on the Argentine Is. Examination of the South Pole seismograms for the Feb. 8 event was disappointing. It was hoped that the Deception I. shock would produce surface wave data for a dispersion study.

E-11746
Elderfield, H.
EFFECTS OF VOLCANISM ON WATER CHEMISTRY, DECEPTION ISLAND, ANTARCTICA. Marine geology, June 1972 13(1), p.M1-M6, 19 refs.
QE39.M3, DGS 530 M3

Analyses are presented of waters from crater lakes on Deception Island and from coastal sea waters which were collected during a period of intense fumarolic activity and increasing seismic activity prior to the 1969 eruption. Major-component analysis shows all samples to be slightly modified sea waters. However, crater-lake waters are almost saturated with silica and all waters contain high levels of manganese, suggesting a significant volcanic source for these elements.

E-11789
Hendy, C.H. , Selby, M.J., Wilson, A.T.
DEEP LAKE, CAPE BARNE--ANTARCTICA. Limnology and oceanography, May 1972 17(3), p.356-362, 5 refs.
GC1.L5

Microrelief on the ice of Deep Lake, Ross Island, Antarctica, is attributed to differential ablation, and a 3.3 m high ice cone to tilting of ice blocks beneath a gravel cover of varying thickness. The temperature of the lake water beneath the ice is thought to be a result of solar heating and the chemical stratification to be an indication that there has been an arid period in the immediate past. (Auth.)

E-11793
Watkins, N.D. , Paster, T., Ade-Hall, J.
VARIATION OF MAGNETIC PROPERTIES IN A SINGLE DEEP-SEA PILLOW BASALT. Earth and planetary science letters, May 1970 8(4), Florida State University. Geophysical Fluid Dynamics Institute. Contribution No.21, p.322-328, 40 refs.
QE1.E12

A single 2.5 cm diameter core of 30 cm length has been taken normal to the cooling surface of a single submarine alkalic pillow basalt, recovered from a seamount in the Scotia Sea. The silicate petrology and textures, and the magnetic and opaque mineralogical parameters have been determined at intervals of 2.2 cm along the core. Considerable systematic variations in the magnetic properties are due to quenching rate differences, except towards the lower-center of the pillow, where an optically-undetectable slight increase in oxidation is expressed by change in magnetic stability, Curie point, and sulfide content. It is suggested that very low oxidation state titanomagnetites, abundant fine sulfides, and low Curie points may characterize quenched submarine basalts, probably because cooling rates exceed oxidation rates. Because of the considerable variation in magnetic parameters

(which has also been detected in seven tholeiitic pillow basalts) it is suspected that representative data may not be readily obtained from submarine extrusives.

E-11818
Symposium on continental drift emphasizing the history of the South Atlantic area
CONTINENTAL DRIFT EMPHASIZING THE HISTORY OF THE SOUTH ATLANTIC AREA. A UNESCO/IUGS SYMPOSIUM HELD AT MONTEVIDEO, URUGUAY, ON OCTOBER 16-19, 1967. American Geophysical Union. Transactions, Feb. 1972 53(3), p.164-185 plus 1088 frames 16-mm film, Abstracts only. Text of the papers on 16-mm microfilm from American Geophysical Union. For selected papers see E-11819 through E-11853. QE500.A6

The papers of the symposium are divided into: Part A. The South Atlantic islands and ocean floor. Part B. Geology and geophysics of South America. Part C. Geology and geophysics of Africa. Part D. Comparisons of continents around the Atlantic. Part E. Continental drift in the Pacific Basin and geology of Antarctica. Part F. Gondwanaland, the Tethys, and the Indian Ocean Basin. Part G. Possible mechanisms of continental drift.

E-11819
Capurro, L.R.A.
REVIEW OF THE OCEANOGRAPHY OF THE SOUTH ATLANTIC IN RELATION TO CONTINENTAL DRIFT. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.21-38, Paper No.1. Available on microfilm only. 31 refs.

This paper describes the topography, structure, magnetic anomalies, sediments, and heatflow through the sea floor of the South Atlantic Ocean between the Argentine basin and the mid-Atlantic ridge. It suggests the implications of these findings to the theory of continental drift, and in particular to the hypothesis of spreading ocean floors. The information is largely drawn from published work, mostly done by scientists from Lamont-Doherty Geological Observatory of Columbia University.

E-11820
Simpson, E.S.W. , Needham, H.D.
FLOOR OF THE SOUTHEAST ATLANTIC OCEAN: A REVIEW. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.39-81, Paper No.2. Available on microfilm. Also Lamont-Doherty Geological Observatory Contribution No.1111. 31 refs.

Published studies are reviewed of the geology and geophysics of an area of ocean bounded by the African and Antarctic continents and lying between 20 W and 30 E longitudes with particular reference to the hypothesis of continental drift. The crest of the mid-ocean ridge that swings around southern Africa near 50 S latitude appears similar to the crest of the ridge of the North Atlantic. The Antarctic continental shelf is unusually deep and rugged. Marginal plateaus, separated from the continental shelf by narrow, steep slopes, have been found off the coasts of Angola and west Africa and may be related to similar features near Rio de Janeiro and the Antarctic peninsula. At least one of the marginal plateaus fills a gap in Bullard's best fit of Africa with South America: others occur in zones of good fit or overlap.

E-11821
Maldonado-Koerdell, M.
ANNOTATED BIBLIOGRAPHY ON THE MID-ATLANTIC OCEAN WITH SOME CONSIDERATIONS ON CONTINENTAL DRIFT. Symposium on continental drift emphasizing the case history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.82-98, Paper No.3. Available on microfilm only.

The principal aspects of continental drift are reviewed. The ocean floor is thought to show the surface manifestation of the forces of continental drift. The paper then presents an annotated bibliography of accessible and recent contributions and reports published since 1957 in the journals of countries in South and Central America. The bibliography lists two dozen scientific journals that publish geological and geophysical contributions on all oceans, also special series and proceeedings of regional, national, and international congresses and symposia concerned with ocean basins. Approximately 130 papers in Spanish or Portuguese published since 1957 in Argentina, Brazil, Colombia, and Costa Rica are included.

E-11822
Verwoerd, W.J.
ISLANDS ON THE MID-OCEAN RIDGE BETWEEN AFRICA AND ANTARCTICA. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.108-128, Paper No.6. Available on microfilm only. 46 refs.

This report describes briefly the physiography, glaciology, volcanology, and petrology of Bouvet, Marion, and Prince Edward islands. It discusses their relationships with the submarine topography in the light of current theories of continental drift and ocean-floor spreading It is suggested that difficulties in explaining continental drift in the Southern and Indian oceans by subcrustal convection currents may be resolved if sections of the mid-ocean ridge system are assumed to have migrated to their present positions because of anisotropic expansion of convection cells since the Cretaceous period.

E-11823
Opdyke, N.D. , Knowles, R.
PALEOMAGNETISM OF CORES FROM THE SOUTH ATLANTIC. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.131-145, Paper No.8. Available on microfilm. Also Lamont-Doherty Geological Observatory Contribution No.1137. 14 refs.

Paleomagnetic studies have been made on twenty-five piston cores from the South Atlantic Ocean. The rates of sedimentation in these cores range from 3.5 mm/1000 yr to 27 mm/1000 yr, which are higher by a factor of 10 than rates some previous workers have reported. The thin veneer of sediment over the South Atlantic ridge system cannot have resulted from very low rates of sediment accumulation. These rates are compared with the thickness of sediment obtained by reflection profiling. Distribution of sediment in the South Atlantic does not conflict with modern theories of ocean-floor spreading and continental drift.

E-11824
Dickson, G.O. , Pitman, W.C., III, Heirtzler, J.R.
AGE OF THE SOUTH ATLANTIC FLOOR FROM AN

INTERPRETATION OF MAGNETIC ANOMALIES. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.146-164, Paper No.9. Available on microfilm. Also Lamont-Doherty Geological Contribution No.1133. 20 refs.

Magnetization of material along the axis of the mid-Atlantic ridge and its symmetrical transport out on both sides can explain the great linear, magnetic anomalies in the South Atlantic Ocean basin. By dating anomalies near the ridge crest in terms of known geomagnetic field reversals, one may extrapolate the ages of other anomalies and determine the spreading velocity. Much of the ocean floor can be dated thus, but the Walvis ridge and Rio Grande rise prevent identification of anomalies close to the continental shelves. Data from many oceans suggest that the spreading velocity has been nearly constant for the last 80 m.y. This assumption enables the evolution of the South Atlantic floor to be reconstructed. Similar studies of the Pacific Ocean floor west of South America and the Indian Ocean floor east of Africa indicate spreading there also so that the ocean floor controls interpretation of continental drift.

E-11825
Maack, R.
CONTINENTAL DRIFT AND GEOLOGY OF THE SOUTH ATLANTIC OCEAN. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.185-235, Paper No.12. Available on microfilm only. Numerous refs.

An account of the history of the development of the hypothesis of continental drift is followed by a summary of the chief features of the development of the South Atlantic Ocean, with special reference to volcanism at the time of disruption and the islands in that ocean basin. The paper is essentially an abbreviated (and translated) version of the author's book Kontinentaldrift und Geologie des Sudatlantischen Ozeans.

E-11826
Creer, K.M.
PALEOMAGNETISM OF SOME LOWER PALEOZOIC SOUTH AMERICAN ROCKS. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.236-266, Paper No.13. Available on microfilm only. 7 refs.

New measurements of the location of the south pole have been made by standard paleomagnetic practice on rocks from Lower and Middle Paleozoic formations in Argentina, Bolivia, and Brazil. All six pole positions so determined lie on the northeast coast of Brazil or in the Atlantic Ocean basin northeast of the mouth of the Amazon River.

E-11827
Valencio, D.A.
PALEOMAGNETIC STUDY OF SOME TRIASSIC FORMATIONS OF ARGENTINA. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.267, Paper No.14. Available on microfilm only.

For the province of Mendoza, Argentina, the position of the ancient south pole, computed from the average direction of the remanent magnetization of the studied formations is longitude 3 E, latitude 53 S. A one-page note of observations is presented giving a pole position in agreement with K.M. Creer's results (See: E-11826).

E-11828
Bossi, J. , Ferrando, L., Albanell, H.
BASAL COMPLEX OF SOUTHEASTERN URUGUAY. Complejo basal del sureste del Uruguay. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.268-280, Paper No.15. Available on microfilm only. In Spanish with English summary. 8 refs.

Uruguay experienced a strong tectonic episode accepted as Lower Cretaceous (130 m.y.). This caused the formation of several grabens, some of which have been already studied in detail. The aim of the present work is to establish the fundamental basis of Jurassic-Cretaceous geology and tectonics in Uruguay, in order to define the continental basement. This will allow further comparison with other members of the controversial Gondwana continent.

E-11829
Loczy, L. de
CONTRIBUTIONS TO THE PALEOGEOGRAPHY AND PALEOTECTONICS OF THE SOUTHERN PART OF BRAZILIAN BLOCK AND THE PARANA GONDWANA BASIN. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.290-309, Paper No.17. Available on microfilm only. 21 refs.

This paper discusses some problems of the paleogeography and tectonic history of the Gondwana strata of the Parana basin and the underlying crystalline basement. During the final stages of the Gondwanic era tectonic processes are clearly related to volcanic events. The pressure of the mobilized lava led to a second stage of fracturing by tension and this with epeirogenic uplift opened channels for the upward moving magma. The basalt was extruded in several stages along linear fissures. The deposits of aeolian sandstone between different lava sheets demonstrates the separation of the stages. Throughout the Mesozoic and Tertiary, until the present time, the Parana basin has remained emergent. Finally some conclusions are drawn regarding the nature of continental drift.

E-11830
de Villiers, J. , Simpson, E.S.W.
LATE-PRECAMBRIAN TECTONIC PATTERNS IN SOUTHWESTERN AFRICA. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.405-416, Paper No.23. Available on microfilm only. 23 refs.

South-West Africa is underlain by an infrastructure which is probably of great age but shows the impress of younger orogenies. Two younger Precambrian tectonic belts are recognized. It is considered that careful reconstruction of such older tectonic patterns, with geochronological support, can provide a useful basis of comparison between postulated adjacent areas under the hypothesis of continental drift.

E-11831
McElhinny, M.W.
MID-CARBONIFEROUS CONTINENTAL DRIFT EPISODE--SOME EVIDENCE FROM AUSTRALIA AND AFRICA. Symposium on continental drift emphasizing the history of the

South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.417-426, Paper No.29. Available on microfilm only. 13 refs.

Paleomagnetic results from the Carboniferous of Australia show that a latitude change of southeastern Australia from about 30 S to about 55 S occurred over a period of not more than 20 m.y. during the mid-Carboniferous. Evidence for this rapid period of polar shift can also be found in paleomagnetic results from Africa for the Permo-Carboniferous. In order that these two periods should coincide in time, it is necessary to reexamine the dating of the Dwyka glaciation in southern Africa. This glaciation must now be placed in the Lower Carboniferous (or Upper Devonian) and therefore precedes the glacial period in Australia. With this change, the paleomagnetic data from both continents become remarkably consistent with L.C. King's reconstruction of Gondwanaland.

S-11832
Ryan, P.J.
PALEOCURRENT ANALYSIS OF THE PERMIAN IN THE GREAT KARROO BASIN OF SOUTH AFRICA. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.431-450, Paper No.25. Available on microfilm only. 16 refs.

Over 7000 measurements of primary sedimentary structures were recorded in rocks of Permian age in the Great Karroo basin of South Africa, with a view to reconstructing the regional paleocurrent patterns. Some 80 percent to 90 percent by volume of the Permian sediments were derived from an extra-continental source. Paleogeographical reconstructions indicate that the present African subcontinent was more extensive during Permian times.

S-11833
McElhinny, M.W.
PALEOMAGNETISM OF THE SOUTHERN CONTINENTS. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.488-519, Paper No.27. Available on microfilm only. 75 refs.

Paleomagnetic data for the Phanerozoic of the southern continents (including India) are critically examined. A total of 62 results (22 for Australia, 19 for Africa, 9 for South America and 6 each for India and Antarctica) meet the stability criteria. An original configuration of Gondwanaland is proposed, which is consistent with the Paleomagnetic data. During the Upper Permian it appears that Africa and Antarctica made a northward and counterclockwise movement with respect to the rest of Gondwanaland. The final breakup occurs during the Upper Cretaceous with the continents drifting apart to their present positions during the Tertiary. Average rates of relative movement between the continents is about 5 cm/yr during this period.

S-11834
Crowell, J.C., Frakes, L.A.
LATE HISTORY OF THE SOUTH ATLANTIC. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.592-601, Paper No.32. Available on microfilm only. 22 refs.

Late Paleozoic strata of Antarctica, the Falkland Islands, South America, and Africa include glacial facies. A late Paleozoic reconstruction of Gondwanaland juxtaposes glacial-marine deposits around the margins of an ancient South Atlantic-Southern Ocean basin. The Mediterranean-type basin overlapped Antarctica south of the Weddell Sea, the southern Cape Province of South Africa, the Southern Hills region of Buenos Aires in Argentina, and the eastern Falkland Islands. Late Paleozoic glacial centers covered South-West Africa and adjoining parts of South Africa and Brazil. Other centers occupied western east Antarctica, the crest of a pre-Andean cordillera along the western part of South America, and Patagonia west of the Falkland Islands.

S-11835
Dott, R.H., Jr.
ANTIQUITY OF THE SCOTIA ARC. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.602-605, Paper No.33. Available on microfilm. Also Contribution No.213, Geophysical and Polar Research Center, University of Wisconsin. 29 refs.

It is generally assumed that the Scotia arc, an oceanic mobile belt, came into existence in Mesozoic or Paleozoic time, and has been a persistent tectonic feature ever since. Development of the Scotia region seems to have occurred in three distinct phases: 1. The continents of Antarctica and South America originally were completely contiguous with a continuous proto-Andean Paleozoic mobile belt along the west margin of the supercontinent; 2. Late Mesozoic and early Cenozoic disruption of the old continental foundation was accompained by widespread Jurassic volcanism and intense transcurrent faulting, which opened a crustal chasm to form the Scotia Sea; 3. Formation of the Scotia arc occurred during late Cenozoic time on newly-formed crust.

S-11836
Griffiths, D.H., Ashcroft, W.A., Barker, P.F., Parkinson, L.E.
MARINE GEOPHYSICAL STUDIES IN THE SCOTIA ARC AND SEA. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.606, Paper No.34. Available on microfilm only.

This progress report presents geophysical investigations of the Scotia arc and Sea, conducted with the support of the British Antarctic Survey, and takes the form of a single-page extended abstract.

S-11837
Jackins, J.M.
PERMIAN OF AUSTRALIA AND NEW ZEALAND AND THEORIES OF TECTONISM. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.686-689, Paper No.41. Available on microfilm only. 26 refs.

Recent data suggest that tension predominated in western, central, and eastern Australia in the Lower Permian, whereas in eastern Australia, compression predominated in the Upper Permian. Although not exhaustive, this evidence best fits periodic expansion and compression of the earth's crust. More information and synthesis on the time and nature of tectonic movement is required to judge theories of the earth's development. (Auth.)

E-11838
Melville, R.
MODERN PLANT DISTRIBUTIONS IN SOUTH AMERICA AND THEIR RELATION TO CONTINENTAL DRIFT. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.690-709, Paper No.42. Available on microfilm only. 11 refs.

Distribution of plant species, genera, and families common to South America and Africa suggest that an entire flora was split in two, as South America and Africa were separated by continental drift. Direct dispersal across the South Atlantic is not possible for most species and a temporary land bridge would lead to a preponderance of categories in the lower ranks.

E-11839
Waterhouse, J.B.
CONTINENTAL DISPLACEMENT OF NEW ZEALAND. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.710-723, Paper No.43. Available on microfilm only. 34 refs.

The pre-Cretaceous rocks of New Zealand are divided into two segments. The western has strata and faunas typical of Gondwanaland, and during the Permian period its latitude was near 75 S. The eastern segment is divided into three facies of which the westernmost is made of volcanics extruded during the initial opening of the Tasman Sea in the Upper Paleozoic. Faunas from all three facies suggest Tethyan affinities, while their position during the Permian appears to have been north of Queensland at a latitude of 55 S. In the Mesozoic, much of the Tethyan segment of New Zealand piled into a great log-jam of imbricate sheaths and, therefore, did not move far north, while the Gondwana segment, moving north more rapidly, overtook it in the late Jurassic. The contact between the two segments is marked by a megashear. The log-jam of sheaths later became teased into steeply plunging similar folds. Granite invaded the region of the megashear and the whole region including both segments, the megashear and the granite became twisted into the great Southland orocine. This snapped along the Alpine fault in the late Tertiary. (Auth.)

E-11840
Halpern, M.
GEOLOGIC SIGNIFICANCE OF ISOTOPIC AGE MEASUREMENTS OF ROCKS FROM TIERRA DEL FUEGO, CHILE. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.724-744, Paper No.44. Available on microfilm only. 22 refs.

Rubidium-strontium isochron dates from duplicate analyses of whole rock and biotite concentrates of eight samples from the Beagle Canal and Strait of Magellan regions of southern Chile give the following ages: (1) 12 m.y. for the Cerro Paine quartz monzonite laccolith, which intrudes Upper Cretaceous sedimentary rocks; (2) 57 to 71 m.y. for granite samples from morainal material at the tongue of Ventisquero Alemania, which flows southerly out of Cordillera Darwin; (3) 77 to 82 m.y. for granite samples of the Andean intrusive suite, which intrudes the Lower Cretaceous Yahgan formation; and (4) 267 m.y. for biotite from granodiorite gneiss from the basement of the Magellan basin near the eastern end of the Strait of Magellan. Potassium-argone dating of three samples give the following measured ages: (1) 92 m.y. for hornblende from andesitic volcanic rock at Isla Bertrand; (2) 64 m.y. for porphyroblastic muscovite from paraschist at Bahia Yendegaia; and (3) 38 m.y. for hornblende from amphibolite at Ventisquero Italia. The Cretaceous Andean intrusive suite can now be correlated with similar plutonic bodies of West Antarctica. Disruption of a continental strip once joining South America and Antarctica probably occurred in post-Cretaceous time. Detailed investigations of the Cordillera Darwin intrusives and the late Paleozoic metamorphism should be undertaken before correlation is attempted with other southern hemisphere continents. (Auth.)

E-11841
Neethling, D.C.
EARLIER PRECAMBRIAN METASEDIMENTARY AND ALTERED VOLCANIC ROCKS OF WESTERN QUEEN MAUD LAND. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.745-762, Paper No.45. Available on microfilm only. 22 refs.

A short progress report on the geological exploration of the South African National Antarctic Expeditions in western Queen Maud Land is provided. Previous references to the age of the sedimentary sequence exposed to the west of the Greenwich Meridian appears to have accepted a Gondwana correlation based mainly on the subhorizontal attitude of the beds and the occurrence of intrusive dolerite sills and associated volcanics. However, K40/A40 dating on dolerite from the northwestern part of the Ahlmann Ridge indicates a Precambrian age for the sedimentary rocks. The implications of the absolute age determinations are briefly discussed, and correlations with the Precambrian sedimentary systems of southern Africa are suggested.

E-11842
Palmer, H.C.
PRELIMINARY PALEOMAGNETIC RESULTS FROM CHILE AND PERU. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.763-776, Paper No.46. Available on microfilm only. 10 refs.

Paleomagnetic data are reported for Middle Jurassic lavas from the Arica area of Chile, Lower to Upper Cretaceous volcanics from the La Serena area of Chile, and for probably Lower Tertiary dikes from Peru. AC demagnetization improves the precision of the mean directions of remanent magnetization for the three units studied; Jurassic lavas and the Peru dikes have both normal and reversed polarities. The calculated Jurassic pole is 6.1 W, 72.5 S. The Cretaceous rocks yield a pole position of 73.5 E, 81.6 S, which agrees with Creer's calculated pole from the Serra Geral formation of Brazil and Uruguay. The Peruvian dikes, however, give a pole position (0.4 W, 67.4 S) which is farther from the present geographic pole. The Peruvian dike data can be brought into agreement with the Chilean Cretaceous data if it is assumed that the Peruvian Andes have been rotated with respect to the Chilean Andes about the Peruvian orocline. However, the Peruvian dikes may be much younger than Cretaceous; the field with respect to South America during this time may have been farther removed from the present dipole field than it was in the Cretaceous. Alternatively, the Peruvian dikes may have yielded a VGP in which secular variation has not been averaged out. (Auth.)

8-11843
Matthews, D.H.
CONTINENTAL DRIFT AND THE FLOOR OF THE INDIAN OCEAN. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.777-822, Paper No.47. Available on microfilm only. 161 refs.

The International Indian Ocean Expedition, (IIOE) 1959-1965, collected a great deal of new information about the geology of the floor of the Indian Ocean. During the first half of 1967 both R.R.S. Discovery and R.V. Vityaz made cruises in the Indian Ocean. Three maps of the whole Indian Ocean synthesize large amounts of data: Bezrukov and Lisitzin [1966] have shown the distribution of sediments exposed on the sea floor, Heezen and Tharp [1964] have used many soundings to draw a physiographic diagram that distinguishes structurally distinct provinces on the basis of their characteristic topography, and Kanaev and Udintsev [Udintsev, 1966] have utilized soundings and geophysical data on crustal structure and other features (and some preconceived hypotheses) to draw a map of the tectonic scheme of the Indian Ocean. The two latter maps form a necessary prolegomena to any discussion of continental drift in the Indian Ocean. They have been briefly discussed in this light by their authors [Udintsev, 1966; Heezen and Tharp, 1965]. (Auth. mod.)

8-11844
Krishnan, M.S.
REVIEW OF EVIDENCE FOR THE DRIFT OF INDIA. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.823-839, Paper No.48. Available on microfilm only. 82 refs.

An attempt is made in this contribution to bring together evidence, stratigraphic, tectonic, and geophysical, in support of the thesis that India was part of Gondwanaland in the southern hemisphere and became welded to Asia only in the earlier part of the Tertiary era. The zone of junction with Asia is now occupied by the Himalayan orogen (including the Baluchistan and Burmese arcs) which was a highly mobile belt throughout the Tertiary. Great batholithic masses of granodiorite and granite have been intruded along the Himalayan axis between the Nanga Parbat and Namcha Barwa, these being connected with the periods of uplift in the Miocene and Plio-Pleistocene. Contemporaneously, the Indian Ocean gradually widened, and it is possible to connect the structures therein to the successive phases of orogeny in the Himalayas.

8-11845
Wilson, A.F.
SIGNIFICANCE OF CHARNOCKITIC TERRANES IN RELATION TO THE CONCEPT OF CONTINENTAL DRIFT. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.840-854, Paper No.49. Available on microfilm only. 12 refs.

Tempting correlations of continental fragments using charnockitic terrains have been suggested, but several features are pointed out to show the inadequacy of their use for correlation. The Australian coastal granulite terrains are much narrower than the ocean left even after a good 'fit' of appropriate continental fragments. Problems of polymetamorphism limit the value of isotope 'dating' of granulites. Moreover, as the fold trends of many granulite terrains are parallel to major coastlines, correlations of post-basement geological features may be more meaningful than correlation of granulite trends.

8-11846
Creer, K.M.
SYNTHESIS OF WORLDWIDE PALEOMAGNETIC DATA. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.855-886, Paper No.50. Available on microfilm only. 84 refs.

An analysis of worldwide paleomagnetic data reveals similarities in the shapes of the Upper Paleozoic parts of the polar wandering curves for the different continents. By superposition of corresponding parts of their polar wandering curves, the positions of the continents during the Upper Paleozoic have been deduced. The reconstruction consists of two supercontinents, (a) Europe and western Russia and North America, and (b) the present southern hemisphere continents and India, and is thus similar to earlier reconstructions based on geological evidence, of which it is however completely independent. The south pole is shown to have wandered across these large land masses during the Upper Paleozoic, and in the Devonian was situated in northwest Africa. The north pole must have been in the middle of a large ocean. (Auth.)

8-11847
Vine, F.J.
USE OF PALEOMAGNETISM IN ELUCIDATING THE HISTORY OF THE OCEAN BASINS. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.897-906, Paper No.51. Available on microfilm only. 27 refs.

If ocean-floor spreading has occurred, then recent rates of spreading may be deduced from total field magnetic anomalies observed over mid-ocean ridge crests together with reversal time-scale for the earth's magnetic field for the past 4 m.y. Such rates, typically a few centimeters per year, are consistent with the breakup of the continents and the formation of the present ocean basins within the past 200 m.y. Linear magnetic anomalies throughout the ocean basins and parallel or subparallel ridge crests record the progress of the spreading sea floor and in places extend to the continental margin. This is particularly clear in the South Atlantic, between New Zealand and West Antarctica, and between Australia and East Antarctica, the latter areas are respectively two-thirds and one-third the age of the former. Oceanic areas over which the earth's magnetic field is relatively undisturbed may have been formed when the earth's field was of single polarity for a long time. One such interval, the Kiaman, has been suggested, but others, as yet undefined by paleomagnetic studies, may exist. Finally, the analysis of bathymetric and total field magnetic surveys of isolated topographic features may indicate the paleolatitude at their time of formation. (Auth.)

8-11848
Briden, J.C.
RECURRENT CONTINENTAL DRIFT OF GONDWANALAND. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.907-922, Paper No.52. Available on microfilm only. 28 refs.

The paleomagnetic results from all the Gondwana continents are compatible with a drift history consisting of eipsodes of rapid drift.

While the uses of paleomagnetic data are expanded here by determining reconstructions and identifying intermittent drift, it is clear that there are limitations to geological use of individual paleomagnetic studies for estimating paleolatitudes or making correlations within the same quasi-static interval. Recent ideas on ocean-floor spreading lead to a picture of continental drift in terms of lateral plus rotational movement; if the relative amounts of each can be calculated, then ancient longitudes can be estimated. It is not yet possible to incorporate the northern continents into this drift history, but it is unlikely that their pattern of movement is the same as for Gondwanaland. Differences between the Laurasia and Gondwanaland polar wander curves in the late Paleozoic and Mesozoic are probably due to large-scale transcurrent movements along the Tethys, first in one sense and then the reverse, but the sequence of movement cannot yet be worked out.

E-11849
Plumstead, E.P.
PLANT FOSSILS AND LATITUDES. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.923-927, Paper No.53. Available on microfilm only.

Geophysicists and geolcgists are all concerned with reconstructing the globe of past ages as accurately as possible. Each method offers certain advantages and each encounters hazards. Comments are made on some of the proposals, and the use of fossil floras is advocated as one of the few methods offering latitudinal control in global reconstruction.

E-11850
Ahmad, F.
TETHYS. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.928-951, Paper No.54. Available on microfilm only. 66 refs.

This paper examines the paleontological, paleoclimatologic, and paleomagnetic, evidence bearing on the problem of the tethys and concludes that it was an 'ocean.' Two continents, the northern and the southern Laurasia and Gondwanaland, existed and pursued independent courses of drift. Available evidence indicates that Laurasia remained more or less within the tropics, at least from the Cambrian to the Eocene, whereas Gondwanaland apparently drifted from the Silurian to the Cretaceous. If convection currents were responsible for this drifting, the cells must have been directly aligned and could not have formed the divergences underneath the mid-ocean ridges or the convergences underneath the orogenic belts. However, these supercontinents somehow did not collide, but faunal and floral exchanges took place whenever they were close to each other.

E-11851
Bradley, J.
ORIGINS OF CONTINENTAL SHELVES AND THE FIT OF CONTINENTS. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.1063-1079, Paper No.61. Available on microfilm only. 30 refs.

The recognition of the juncture between the present built shelf and platform is essential to drift reconstructions. Otherwise reconstructions join the edges of shelves and merely indicate the last stage of separation. The elimination of present shelves allows a much closer fit of Mesozoic continents. The recognition of earlier built shelves allows the reconstruction of pre-Permian continents and the deduction of still older drifting.

E-11852
Rickard, M.J.
POLYGONAL TESSELATIONS OF THE EARTH'S CRUST AND THEIR BEARING ON CONTINENTAL RECONSTRUCTIONS. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, p.1080-1088, Paper No.62. Available on microfilm only. 11 refs.

Analysis of geotectonic lineaments show that they tend to intersect at 120 and that many are of similar length, thus a global polygonal fracture system is inferred. Similarity of continental and oceanic tectonic pattern has been used as evidence against continental drift. It is explained here as resulting from a uniform upper mantle stress system caused by a general expansion of the earth. This expansion is not necessarily the cause of drift, but the resulting structures are superimposed on, and modify, drift geometrics.

E-11853
Harrington, H.J. comp
ANNOTATED BIBLIOGRAPHY OF THE CIRCUM-PACIFIC RIM AND THE PACIFIC OCEAN BASIN. Symposium on continental drift emphasizing the history of the South Atlantic area, Washington, D.C., American Geophysical Union, 1972, 119p., Paper No.39. Special reference is to Continental Drift and to publications of 1960 to mid-1967. A second bibliography of works published since August 1967 is in preparation at University of New England, New South Wales, 2351, Australia.

This very comprehensive bibliography covers the following topics: General, Paleoclimatology and Biogeography, Antarctica, New Zealand Plateau, Tonga Trench to New Guinea (Australasian Festoon), Australia, Indonesia and Malaysia, Phillipines Region, Taiwan, Japanese Region, Chinese Mainland, Soviet and Adjacent Parts of the Circum-Pacific, Alaska and Aleutian Region, Western Canada, Western U.S.A., Middle and Central America, Western South America, Hawaii, and the Pacific Basin.

E-11864
Sugisaki, R.
TECTONIC ASPECTS OF ANDESITE LINE. Nature physical science, Dec. 4, 1972 240(101), p.109-111, 30 refs.
Q1.N22

Volcanic suites can be classified into three large groups; tholeiitic, alkaline and calc-alkaline. The first two are characterized by basalt and the last by andesite. The distribution of andesite indicates that it occurs along closing boundaries, whereas oceanic tholeiite occurs along opening boundaries. Tremendous volumes of andesitic lava have been erupted in circum-Pacific areas, the compression rate of which is at least 5 cm/yr. Although basaltic rocks predominate the South Sandwich Islands, where the rate of compression is 3 cm/yr on average, andesites also occur. Auckland Island is an example of an alkaline volcanic island, rising from the submerged part of the New Zealand Plateau. Investigations have indicated that the closing movements of plates at rates above 2.5 cm/yr give rise to andesitic magma; between 2.5

cm/yr and near zero rates give the alkaline suite. Extension produced only basaltic magma. Hence, the Andesite Line is interpreted as a plate boundary of compression at rates above 2.5 cm/yr. It follows that the type of magma generated along plate boundaries will depend critically on the rate of plate movement.

E-11887
Halpern, M. , Umpierre Urquhart, M., Linares, E.
RADIOMETRIC AGES OF CRYSTALLINE ROCKS FROM SOUTHERN SOUTH AMERICA AS RELATED TO GONDWANA AND ANDEAN GEOLOGICAL PROVINCES. Conference on Solid Earth Problems, Oct. 26-31, 1970. Buenos Aires, Argentina. Vol. II. Symposium on the Results of Upper Mantle Investigations with Emphasis on Latin America, Buenos Aires, Comite Argentino del Manto Superior, 1972, p.245-256, In English with Spanish summary. 37 refs.

Rubidium-strontium total rock and mineral calculated ages of rocks from southern South America are consistent with the Du Toit (1937) reconstruction of Gondwanaland. Rocks from the Tandil region of Argentina and central Uruguay are dated at about 2000 m.y. probably marking the southern extremity of the Brazil craton and tying South America to the Precambrian craton of southern Africa. Crystalline rocks 600 to 500 m.y. old outcrop in northern interior Argentina, Sierra de la Ventana (Argentina) and southeastern Uruguay. Paleozoic and Triassic igneous and metamorphic rocks about 200 to 500 m.y. old cross San Luis and Cordoba provinces (Argentina), Argentine Patagonia and southeastern Chile. In a Gondwanaland reassembly, these geochronologic provinces join South America to Antarctic and Australia. Marginal to or superimposed upon the fragmented segments of Gondwanaland, a Cretaceous age province of 75 to 120 m.y. circumscribes the South Pacific and links the Andean region of South America to the coastal sector of West Antarctica and South Island, New Zealand. (Auth.)

E-11888
Fleck, R.J. , Mercer, J.H., Nairn, A.E.M., Peterson, D.N.
CHRONOLOGY OF LATE PLIOCENE AND EARLY PLEISTOCENE GLACIAL AND MAGNETIC EVENTS IN SOUTHERN ARGENTINA. Earth and planetary science letters, 1972 16, p.15-22, 17 refs.
QE1.E12

K-Ar and paleomagnetic studies of basalt flows in southern Argentina indicate that the three major normal-polarity events of the Matuyama reversed geomagnetic polarity epoch are recorded in a single cliff section. Till interbedded with the lava flows indicates at least four separate incursions of ice, the earliest prior to 2.06 my ago. Till is present above the basalt flows that record the Reunion event and immediately beneath flows formed during the Olduvai and Jaramillo events. The climatic implications of glaciation of this site are compared with conclusions about southern hemisphere paleotemperatures inferred from the microfossil or coarse-sediment content of deep-sea cores or from marine strata exposed on land. In subantarctic deep-sea cores evidence is found for rapid cooling about 2.5 my ago with a sharp change in sedimentation, which it is believed was caused by the start of large-scale freezing of the seas around Antarctica.

E-11889
DRILLING INTO THE GEOLOGIC HISTORY OF ANTARCTICA. Science news, Nov. 4, 1972 102(19), p.295
Q1.S76

The Dry Valley Drilling Project, a 3-yr international study, will drill into at least 10 sites on the Antarctic continent with the first borehole scheduled for Ross I. in Jan. and Feb. 1973. Scientists from Japan, New Zealand, and the U.S. hope to drill some 600 m into interbedded volcanic and glacial deposits in an effort to derive the geologic and climatic history of the region for the past 65 m.y. The first borehole will also serve to test the drilling rig which stands about 20 ft high, weighs some 15,000 lbs, and is capable of drilling as much as a mile deep.

E-11893
Mercer, J.H.
CHILEAN GLACIAL CHRONOLOGY 20,000 TO 11,000 CARBON-14-YEARS AGO: SOME GLOBAL COMPARISONS. Science, June 9, 1972 Vol.176, p.1118-1120, 12 refs.
Q1.S35

Chilean glaciers at a latitude of 41 S reached a maximum extent about 19,4000 carbon-14 years before the present (B.P.), shrank 50 percent by 16,000 years B.P., and readvanced to a smaller maximum after 14,800 years B.P. These fluctuations were closely in step with those of the Laurentide ice sheet east of the Mississippi River but differ somewhat from the accepted sequence in New Zealand. A corresponding pattern is not apparent in the Antarctic paleotemperature curve deduced from changes in oxygen isotope ratios at Byrd Station. (Auth.)

E-11894
Bull, C.
WRIGHT VALLEY--GEOSCIENCE WORKSHOP OF A CONTINENT. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.225

The significance of the ice-free valleys did not attract much attention until the International Geophysical year. In 1957, as part of the U.S. IGY work, much of the area was reconnoitered and multiple glaciation of the valleys was documented. In the next decade Wright Valley claimed a greater population of earth scientists than any other area of Antarctica. Evidence was found that the region had been subjected to uplift in the last few million years and that its glacial history also spanned the last few million years. Recent work has demolished the Pecten Glaciation and has substituted a fjord in the valley at that time. Most of the papers in this issue of the Antarctic Journal deal with the ice-free valleys.

E-11895
Webb, P.N.
WRIGHT FJORD, PLIOCENE MARINE INVASION OF AN ANTARCTIC DRY VALLEY. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.227-234, 49 refs.

During the initial phase of the Dry Valley Drilling Project fieldwork centered on improving paleontological control of the late Cenozoic sediments in Wright Valley and particular attention was focused on the stratotype of the Pecten glacial episode. Nichols's (1971; E-9845) explanation that the Pecten gravels arrived at their present location by a combination of ice transport and glacio-fluvial reworking is refused on the grounds that the microfaunal assemblage is a natural fjord assemblage, the dominant taxa do not inhabit open sea environments, microfaunal taxa peculiar to open sea and relatively deep water are not present, and the extremely fragile

taxa would not have survived such a rigorous journey. Use of the terms Pecten glacial episode or Pecten glaciation should be discontinued. It seems more likely that relatively warm interglacial conditions prevailed. Pecten gravels represent only the late Pliocene part of the fjord history of Wright Valley.

E-11896
McSaveney, M.J. , McSaveney, E.R.
REAPPRAISAL OF THE PECTEN GLACIAL EPISODE, WRIGHT VALLEY, ANTARCTICA. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.235-240, 38 refs.

The Pecten glacial episode or Pecten glaciation was introduced to account for the occurrence at a single locality in Wright Valley of a stratified layer of sand and gravel overlying till. The following features of the glacial geology of the dry valley area of the McMurdo Sound region are reinterpreted: descriptions of pecten deposits, soil studies, absence of diagenesis, origin of the fossiliferous gravels, lack of outwash characteristics, evidence of bioturbation, Ross Sea elements, and factors against lacustrine hypothesis. It is recommended that the terms Pecten glacial episode and Pecten Glaciation be dropped. The fossiliferous gravels and associated boulder silts at the pecten deposit are here suggested as the type section of the Pecten marine invasion. Correlative boulder silts are absent from Victoria Valley, suggesting that the 700-m threshold to Victoria Valley was not topped by the high relative sea level during the Pecten marine invasion and/or that Victoria Valley was filled by grounded ice at that time.

E-11897
Brooks, H.K.
FJORD DEPOSIT IN WRIGHT VALLEY, ANTARCTICA. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.241-244, 22 refs.

During the field season of 1971-1972, studies were conducted on fossil and petrographic samples from the deposit in Wright Valley near Bull Pass that has been termed Pecten Moraine. It is evident, upon close study, that the thin, stratified layers in which Chlamys (Zygochlamys) tuftensis Turner occurs in great abundance (in some cases making up more than 30 percent of the mass of the deposit), are not till nor glaciofluvial deposits as has been so widely accepted. They are glacio-marine fjord deposits dating back to the early glacial history of the coastal mountainous areas of Antarctica. The intermittent, localized occurrence of a single, vagrant, euryhaline pecten species in great abundance is in keeping with an in situ unstable fjord environment in close proximity to a glacial outwash source. A most remarkable characteristic of the matrix sediments associated with the Chlamys shells in the Pecten Moraine is the high percentage of wind-rounded and etched quartz grains especially in the class interval 0.5 to 1.0 mm.

E-11898
Fleck, R.J. , Jones, L.M., Behling, R.E.
K-AR DATES OF THE MCMURDO VOLCANICS AND THEIR RELATION TO THE GLACIAL HISTORY OF WRIGHT VALLEY. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.245-246, 5 refs.

During the 1969-1970 austral summer, samples of basalt were collected from the Loop cones, the cone at the west margin of the accumulation basin of the Meserve Glacier, and the volcanic debris at the surface and at 1-m depth of the Alpine II moraine on the west side of the Meserve Glacier for K-Ar date determinations. The oldest basalt found in the Meserve drainage is the 3.4 m.y. basalt in the Alpine II moraine. Available age determinations now suggest that the major axial valley-cutting glaciation occurred over 4.2 m.y. ago. Alpine glaciations probably began more recently than 3.4-3.5 m.y. ago, although the water-eroded channel west of the Meserve Glacier may be related to subglacial eruption of the 3.4 m.y. basalt. Volcanism occurred at the western margin of the Meserve accumulation basin approximately 2.5 m.y. ago, and both older and possibly younger volcanics were later reworked during the Alpine II glaciations, being incorporated in moraines on both sides of the glacier.

E-11899
Behling, R.E.
CALCULATED DATES OF SELECTED GLACIAL EVENTS IN WRIGHT VALLEY. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.247-248, 9 refs.

Two time-dependent properties showing consistent trends in the chronological sequence of Alpine Glaciation soils were tested by reaction kinetics. They were 1) the elemental potassium content of medium and fine silt, and 2) soil salt-concentration. These two dating methods provide supportive evidence for placing the Alpine II Glaciation of Meserve Glacier between 240,000 and 320,000 years ago, and the Alpine I Glaciation between 4,400 and 6,000 years ago. A revised tentative sequence of glaciations in Wright Valley determined by soil and weathering observations is presented and significant changes and additions to the sequence are summarized.

E-11919
González Ferrán, O.
PAULET ISLAND, A RECENT VOLCANO. Isla Paulet, un volcán de edad reciente. Santiago de Chile. Instituto Antártico Chileno. Boletín, 1972 No.7, p.13, In Spanish.

The history and composition of the volcanic island Paulet are analyzed and related to those of James Ross Island. Paulet Island is primarily lava and pyroclastic rock with a basalt-olivinic composition. Volcanic activity dates from the Recent Pleistocene. Petrographic samples were collected for geochemical, petrographic and dating analyses but no data is given.

E-11925
Covacevich C., V. , Hernandez P., P.
PALEONTOLOGICAL INVESTIGATIONS ON THE SOUTH SHETLANDS, 1970-1971. Investigaciones paleontológicas en las Islas Shetland del Sur. Antártica, 1970-1971. Santiago de Chile. Instituto Antártico Chileno. Boletín, 1971 No.6, p.3-7, In Spanish. 9 refs.

Paleontological research in the South Shetlands is being undertaken by Chile in hopes of determining the relationship between life forms in Antarctica and South America. In the President Head area Jurassic plant fossils and two types of insect fossils were located in very good condition. On Byers Peninsula Mesozoic marine and terrestrial animal fossils and a rich group of tree fossils were located. One page of photographs of the fossils is included.

E-11935
James, P.
LAND UNDER REFRIGERATION. Geographical magazine, Sept. 1972 44(12), p.853-857
G1.G343

The periglacial and geomorphological effects of frost and snow on landform development are discussed. The most important forms of ground ice are needles, lenses, and ice-wedges which are restricted to the permanently frozen ground of the Arctic and Antarctic. Permafrost is characteristic of the Antarctic, Arctic, and sub-Arctic. Geomorphological processes related to the presence of snow cover are nivation, or snow-patch erosion, and erosion, and deposition by avalanches. Frost weathering and solifluction are the most important periglacial processes; the former erodes and the latter transports and deposits. One of the most striking effects of frost action is patterned ground which results from the combination of frost-heave, solifluction and contraction cracking and occurs most extensively over permafrost. The nature of frost processes in cold, mountainous, and tropical regions is discussed. Computer simulation models are now being used to predict the likely results of frost action in any given conditions of site and climate.

E-11942
Grikurov, G.E. , Krylov, A.IA., Poliakov, M.M., Tsovbun, IA.N.
AGE OF ROCKS IN THE NORTHERN PART OF THE ANTARCTIC PENINSULA AND ON THE SOUTH SHETLAND ISLAND (ACCORDING TO POTASSIUM-ARGON DATA). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.61-63, Translated from its Informatsionnyi biulleten', No.80, 1970. 9 refs.

A whole-rock investigation of samples from the northern Antarctic Peninsula and South Shetland Islands was made and age determined by potassium-argon dating. The data indicates that the Middle Cretaceous was a period of extremely intense tectonic-magmatic development of the Antarctandes due to the development of a major orogeny in their axial zone. A group of potassium-argon ages at a limit of about 50 my indicating a Paleogenic stage of uplift and accompanying magmatism in the flank zones of Antarctandean orogenesis, is established for the first time.

E-11943
Krylov, A.IA. , Lopatin, B.G., Mazina, T.I.
AGE OF ROCKS IN THE FORD RANGES AND ON RUPPERT COAST (WESTERN PART OF BYRD LAND). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.64-66, Translated from its Informatsionnyi biulleten', No.80, 1970. 6 refs.

Whole-rock potassium-argon dating of metamorphic and intrusive rocks from the Ford Ranges and the Ruppert Coast are reported, based on 13 samples collected in 1966-67. Absolute age determinations have enabled identification of an epoch of post-Baikalian tectogenesis in the vicinity of the Ford Ranges. Most determinations indicate a Cretaceous age. Rocks of the gneiss complex of the Fosdick Mountains are rejuvenated; biotite granite from the Wiener Peaks, 290 my old, suggest mid-Late Paleozoic diastrophism. For the metavolcanites of the Ruppert Coast a Cretaceous age of 115 my was established.

E-11960
Ravich, M.G.
MAJOR RESULTS OF THE II INTERNATICNAL SYMPOSIUM ON THE GEOLOGY AND GEOPHYSICS OF THE CRUST OF THE EARTH IN THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.105-107, Translated from its Informatsionnyi biulleten', No.80, 1970.

Soviet scientists presented the most recent views on the structure of the heterogenous Antarctic platform. Papers on the crystalline basement of the platform and its intrusive formations aroused great interest, as did the problem of charnockites. South African work on the stratigraphy and petrology of the Riphean and Mesozoic sedimentary-volcanic rock masses of the platform was reported. Considerable information on the stratigraphy and structures of the Nimrod group in the Transantarctic Mountains was given. The Antarctic Peninsula was well covered in the symposium but the Ellsworth Mountain region and West Antarctica were somewhat neglected. Most information on research methods concerned marine geophysics or seismic and radar investigations.

E-11967
Watanabe, O. , Yoshimura, A.
PRELIMINARY GEO-SCIENTIFIC RESEARCHES ON SANDERCOCK NUNATAKS, ENDERBY LAND, EAST ANTARCTICA, 1970. Antarctic record, Nov. 1972 No.45, p.47-65, In Japanese with English summary.

Sandercock Nunataks are located at lat. 68 deg 36 min 41 sec S and long. 52 deg 06 min 02 sec E about 500 km east of Showa Station. These nunataks were visited by the JARE 11 traverse party in the summer of 1970. Sandercock Nunataks are composed of four nunataks temporarily named A, B, C and D from north to south. The following surveys and observations were carried out in the area: 1) determination of the location of each nunatak by astronomical surveying and sketch mapping; 2) measurements of geodetic gravity and geomagnetism in the vicinity of the nunataks; 3) geological sketch mapping for each nunatak and sampling of rocks; and 4) observations of the occurrence of inland ice and patterned ground with ground ice on the nunataks.

E-11968
Shiraishi, K. , Watanabe, O., Kizaki, K.
GEOLOGY OF THE SANDERCOCK NUNATAKS IN ENDERBY LAND, EAST ANTARCTICA. Antarctic record, Nov. 1972 No.45, p.66-75, In Japanese with English summary. 3 refs.

The Sandercock Nunataks are composed of several small nunataks which are tentatively named A, B, C and D. Nunatak "A" consists mainly of hornblende-biotite gneiss and Nunatak "B" of hypersthene-garnet gneiss and garnet gneiss. Nunatak "C" is composed of hypersthene-hornblende gneiss. They are associated with apilites, pegmatites and metabasites. The petrographic observations under the microscope reveal that the unstable hypersthene signifies the transition of the granulite facies conditions to the amphibolite facies conditions. The transition is not unusual throughout the East Antarctica platform, particularly in the Lutzow-Holm Bukt area and Queen Maud Land. (Auth.)

E-11969
Torii, T. , Yusa, Y., Nakao, K., Hashimoto, T.
REPORT OF THE JAPANESE SUMMER PARTIES IN DRY VALLEYS, VICTORIA LAND. X. A PRELIMINARY REPORT OF THE GEOPHYSICAL AND GEOCHEMICAL STUDIES AT LAKE VANDA AND IN THE ADJACENT DRY VALLEYS IN 1971-1972. Antarctic record, Nov. 1972 No.45, p.76-88, In Japanese with English summary. 5 refs.

Geophysical and geochemical studies in the Lake Vanda area of the Dry Valleys of South Victoria Land were carried out from the beginning of Nov. 1971, to the middle of Jan. 1972, with supplementary studies at Don Juan Pond, Don Quixote Pond, Lake Bonney, and a preliminary survey of the Victoria Valley. The main subjects for study were: pH, water and ice temperature, electrical conductivity, nutrient matters, thickness and density of the lake ice, ice ablation, the melting at the lower surface of the lake ice, solar radiation, and routine weather observations. (Auth.)

E-11970
Nakao, K. , Nishizaki, Y., Nakayama, K.
REPORT OF THE JAPANESE SUMMER PARTIES IN DRY VALLEYS, VICTORIA LAND, 1971-1972. XI. SEDIMENTARY STRUCTURE NEAR THE SALINE LAKES IN THREE ICE-FREE VALLEYS, VICTORIA LAND, ANTARCTICA, INFERRED FROM ELECTRICAL DEPTH SOUNDING. Antarctic record, Nov. 1972 No.45, p.89-104, 15 refs.

Electrical depth soundings were carried out near saline lakes in Wright, Taylor, and Victoria Valleys. Study locations were chosen at Don Juan Pond, Don Quixote Pond, on the western edge of Lake Vanda, along the lower reaches of the Onyx River in Wright Valley, Lake Vida in Victoria Valley, and at Lake Fryxell in Taylor Valley. In the greater part of the areas bordering the saline lakes, there seems to exist a low resistivity layer below a confining permafrost. These layers sometimes begin even from the surface of the ground-for example, at Don Juan Pond and in an area approximately 1.5 km from the western edge of Lake Vanda. The value of resistivity was usually less than 0.01 ohm-meter. Resistivity is low in the area surrounding the lakes because the permafrost contains saline water which is partially unfrozen at about -20 C (annual mean air temperature). The presence of unfrozen saline water seems to be related to the features of the past and present lake basins themselves and to the salt concentration resulting from the reduction in ancient lake levels.

E-11976
Montigny, R. , Faure, G.
ISOTOPIC HOMOGENIZATION OF WHOLE ROCKS IN THE PROCESS OF METAMORPHISM IN WISCONSIN RANGE, ANTARCTICA. Contribution au problème de l'homogénéisation isotopique du strontium des roches totales au cours du métamorphisme: Cas du Wisconsin Range, Antarctique. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Série D, Feb. 17, 1969 Vol.268, p.1012-1015, In French. 3 refs.

The problem of isotopic homogenization of rocks during metamorphism is studied with metavolcanic and metasedimentary specimens of the Wisconsin Range (Horlick Mountains). Strontium values and the metamorphic aspect of the rock suggests that the age determined by construction of the isochrone is the age of metamorphism. This age is confirmed on other rocks (granite and rhyolite), dated respectively at 480 and 470 my (Faure), suggesting that the sedimentation period is before 620 my. Three factors influenced the lack of homogenization of volcanic rocks (while metasedimentary rocks were homogenized): different location geographically, metavolcanic rocks overlay the metasedimentary ones, in the metasedimentary rocks the lack of an acceptor made the Sr more mobile, permitting long migrations.

E-12007
Schaeffer, B.
JURASSIC FISH FROM ANTARCTICA. American Museum novitates, June 30, 1972 No.2495, 17p., 18 refs.
QL1.A436

The first Mesozoic actinopterygian fishes from Antarctica were discovered in lacustrine interbeds within the Lower Jurassic Kirkpatrick Basalt, in the Transantarctic Mountains, Victoria Land. Except for an enigmatic patch of scales, all the specimens collected are assigned to a new genus and species, Oreochima ellioti, which is placed in the pholidophoriform family Archaeomaenidae. Prior to this discovery, the archaeomaenids were known only from Lower Jurassic continental deposits of Australia. (Auth.)

E-12028
Kudriavtsev, N.F.
ANOTHER VOLCANIC ERUPTION ON DECEPTION ISLAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.161, Translated from its Informatsionnyi biulleten', No.81, 1970.

The February 1969 volcanic eruption on Deception Island, which followed several days of earthquakes, caught an English scientific team by surprise in the open, forcing them to protect themselves with their luggage from falling rocks. By the time they returned to their base an hour later, a large stream of meltwater had formed and was flooding the buildings. The scientists were rescued by helicopter and the eruption subsided within a day or two.

E-12044
Schopf, J.M.
PLANT MATERIAL FROM THE MIERS BLUFF FORMATION OF THE SOUTH SHETLAND ISLANDS. Ohio. State University, Columbus. Institute of Polar Studies. Report, Jan. 1973 No.45, 44p., 22 refs.

The Miers Bluff Formation, a quartzose graywacke and shale sequence, has been tentatively correlated by Hobbs with the Trinity Peninsula Series dated as Carboniferous(?). The formation also shows close lithologic resemblance to the Legoupil Formation (Lower Cretaceous) from an adjacent area on the Antarctic Peninsula. Examination of the poorly preserved material contained in rocks of the Miers Bluff Formation of Livingston Island provides scant evidence for age determination, but will serve as a basis for comparison with similar material from Antarctic areas having similar rocks.

E-12046
Aucamp, A.P.H.
GEOLOGY OF GRUNEHOGNA, AHLMANNRYGGEN, WESTERN DRONNING MAUD LAND. South African journal of antarctic research, 1972 No.2, p.16-22, In English with Afrikaans summary. 15 refs.

A low-grade metamorphosed sedimentary sequence, 300 m thick, occurs at Grunehogna. The upper portion of the Schumacher and three members of the Hogfonna Formation are described and their correlation discussed. The sedimentary sequence is extensively intruded by mafic sheets and dykes, and seven possible phases of igneous activity are distinguished. (Auth.)

E-12047
Watters, B.R.
STRAUMSNUTANE VOLCANICS, WESTERN DRONNING MAUD

LAND, ANTARCTICA. South African journal of antarctic research, 1972 No.2, p.23-31, In English with Afrikaans summary. 13 refs.

The detailed mapping of the Straumsnutane Formation located on the Ahlmannryggen, western Dronning Maud Land, Antarctica, was undertaken during 1968 by the Ninth South African National Antarctic Expedition. This Formation has a total thickness of 860 m in the Straumsnutane, the type area, and may be divided tentatively into four conformable members, viz a lower member comprising 260 m of lava characterized by very large amygdales; a transitional member of 100 m thickness; a middle member consisting of 100 m of alternating amygdaloidal and non-amygdaloidal lava; and an upper member comprising 400 m of predominantly amygdaloidal lava, with subordinate dense lava and characteristic pillow structures. Minor intercalated sediments occur in the upper half of this member. The volcanic rocks are intruded by dolerite and olivine-bearing basaltic dykes generally striking 0 - 25 deg true. The lava would appear to have had a source area lying to the west and north of the present exposures. Block-faulting, with some associated shearing, is the dominant structural feature of the area. Small amounts of copper carbonate staining are ubiquitous in the lavas. Petrographically the lava is a highly altered porphyritic andesite with varying proportions of a glassy mesostasis. Plagioclase has a composition An34 to An40. Alteration to chlorite and epidote is extensive and in some cases complete. (Auth.)

E-12061
Crawford, A.R. , Campbell, K.S.W.
LARGE-SCALE HORIZONTAL DISPLACEMENT WITHIN AUSTRALO-ANTARCTICA IN THE ORDOVICIAN. Nature physical science, Jan. 1, 1973 241(105), p.11-14, 26 refs.

There has been a common assumption that during the Phanerozoic all the major Precambrian welded assemblages have acted as single units. Evidence is produced suggesting that in Australo-Antarctica major horizontal displacement of crustal units occurred in the Ordovician, which was probably related to its very large movement as a whole in relation to the dipole axis between the Cambrian and the Devonian, as is implied by paleomagnetic reconstructions. Displacement of so large a mosaic on so great a scale must have led to considerable internal readjustment. Such movement explains many anomalies of Australian geology and affects concepts of an "Australian Platform" and an "Antarctic Platform", and the development of the Tasman and Ross Orogens.

E-12065
Dutro, J.T., Jr.
PALEONTOLOGY. Geotimes, Jan. 1973 18(1), p.28

During the year an increased emphases on synthesis of paleontologic thought and exploration of new ways to look at paleontologic data was signaled by 2 symposiums at the 1971 meetings of the Geological Society of America and the Paleontological Society of Washington, a textbook, and a number of papers. Data on the occurrence of a diversified (Lystrosaurus fauna in Antarctica was provided recently by J.W. Kitching et al (1972; E-10425). These new finds strongly suggest a broad connection between Antarctica and South Africa in Early Triassic time and provide convincing evidence in support of Gondwanaland and continental drift in the Southern Hemisphere.

E-12067
MacNamara, E.E.
FRESHWATER LAKES AND THEIR DYNAMICS, COASTAL ENDERBY LAND, ANTARCTICA. Symposium on Hydrogeochemistry and Biogeochemistry, Tokyo, 1970. Proceedings. Vol.I: Hydrogeochemistry, Washington, D.C., Clarke Company, 1973, p.633-646, 38 refs.

The physical and chemical properties--their seasonal dynamics and long term trends--of freshwater lakes, ponds, and meltpools of coastal ice-free areas of Enderby Land, Antarctica are discussed. Data reveal that the lakes and ponds are significantly less mineralized than has been reported in other ice-free areas of Antarctica. The minor mineralization can be correlated with rock weathering, ion mobility and ocean derived aerosols. Data on microclimate, geochemistry of soil formation, and position of soluble salt crusts are related to mineralization of the freshwater lakes. (Auth.)

E-12069
Yoshida, Y. , Torii, T., Yamagata, N.
ANTARCTIC SALINE LAKES. Symposium on Hydrogeochemistry and Biogeochemistry, Tokyo, 1970. Proceedings. Vol.I: Hydrogeochemistry, Washington, D.C., Clarke Company, 1973, p.652-660, 8 refs.

In the Antarctic ice free areas south of Showa Station, saline lakes are among the most striking features. The chemical composition of these lakes suggests a similarity to that of sea water as does the cationic composition. The anionic composition, however, shifts away from that of sea water. Geomorphic development of the topography near the lakes suggests a sea water origin under frigid conditions for these lakes on the basis of mineral content and carbon dating of organic remains in the sediments on the raised beaches. This hypothesis of a sea water origin of the lakes requires further investigation.

E-12103
Theyer, F.
GLOBOROTALIA TRUNCATULINOIDES DATUM PLANE: EVIDENCE FOR A GAUSS (PLIOCENE) AGE IN SUBANTARCTIC CORES. Nature physical science, Feb. 19, 1973 241(112), p.142-145, 22 refs.
Q1.N22

In the past, the first appearance of the planktonic foraminifer Globorotalia truncatulinoides (d'Orbigny) was one of the most reliable Neogene foraminiferal datum planes. It was widely accepted as marking the onset of the Pleistocene at about 1.8 m.y. BP during the Matuyama Magnetic Epoch, but this datum must now be restricted in the southern hemisphere to areas north of about 36 S. A concurrent analysis of radiolarians and planktonic foraminifers in 18 deep-sea cores (12 of which were dated paleomagnetically) from south of Australia and the Tasman Basin demonstrates that, in that area, G. truncatulinoides appeared during the Gauss Epoch. This predates its appearance in lower latitudes by 1-1.5 m.y.

E-12117
Skidmore, M.J. , Clarkson, P.D.
PHYSIOGRAPHY AND GLACIAL GEOMORPHOLOGY OF THE SHACKLETON RANGE. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.69-80, 17 refs.

This paper revises, enlarges and extends the work of Stephenson (1966; E-9695). The physiographical evolution of the major land forms is described with particular reference to the peneplaned surface which forms summit plateaux in certain parts of the range. The glaciation and

morphology of the range are related, where possible, to the underlying geology. The implications of patterned ground and gypsum soils as evidence of a former interstadial period are discussed.

E-12119
Thomson, M.R.A.
NEW DISCOVERIES OF FOSSILS IN THE UPPER JURASSIC VOLCANIC GROUP OF ADELAIDE ISLAND. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.95-101, 12 refs.

New discoveries of fossils at eight localities in the Upper Jurassic Volcanic Group of Adelaide Island are described together with new collections from known localities. Ammonites and marine bivalves are reported for the first time and they confirm the Upper Jurassic age assigned to the volcanic sequence. (Auth.)

E-12120
Elderfield, H.
IRON, MANGANESE AND SILICON IN WATERS OF DECEPTION ISLAND. British Antarctic Survey. Bulletin, Oct. 1972 No.30, p.103-104, 6 refs.

Water samples from crater lakes on Deception Island and from coastal sea-waters collected immediately prior to the 1969 eruption are often enriched in Fe, Mn, and Si, indicating a significant volcanic source for these elements. (Auth.)

E-12142
Vucetich, C.G. , Topping, W.W.
FIORD ORIGIN FOR THE PECTEN DEPOSITS, WRIGHT VALLEY, ANTARCTICA. New Zealand journal of geology and geophysics, Dec. 1972 15(4), p.660-673, 11 refs.
QE1.N55

Marine deposits that postdate the Vanda glacial episode, and are here named Prospect Formation, floor the western Wright Valley, Antarctica. At the type locality they comprise a basal silt till with dropped pebbles, passing abruptly to 4 m gravel and sand incorporating two layers of in situ pecten shells Chlamys (Zygochlamys) tuftsensis. The pectens have occupied gravel substrates locally provided by influxes of coarse detritus during the last marine incursion. The basal silt of the Prospect Formation was deposited from ice floating in "Wright" fiord. The floor of that fiord has been uplifted so that the entrance of Wright Valley now has a threshold height of at least 300 m. The foot of the Wilson Piedmont at this threshold is the eastwards remnant of the old fiord glacier. To the west, ice stranding created the ancestral Lake Vanda. Subsequent lake levels marked by benches record the Wright Lower glacial episodes. Basalts 3.9 m.y. old are reworked in the oldest recognized Wright Lower glacial deposits which overlie Prospect Formation, giving a minimum age for this marine incursion. (Auth.)

E-12144
Glazovskaia, M.A.
TYPES OF GEOCHEMICAL SOIL CATENAS. Soviet geography: review and translation, April 1970 11(4), p.235-245, Translated from: Moscow. Universitet. Vestnik. Seriia 5 Geografiia, No.5, p.3-11, 1969. 11 refs.

The existence of geochemical soil catenas, in which the lateral migration of chemical elements links the related soils of uplands, slopes, and depressions into a geochemical entity, is suggested. On the basis of the conditions of migration, soils are divided into geochemically autonomous eluvial soils on uplands, and geochemically subordinate soils on slopes (transaccumulative situations) and in depressions (superaqueous situations). In humid regions, geochemical soil catenas are distinguished mainly on the basis of the mobility of iron and aluminum compounds; in arid regions, mostly in terms of the mobility of the sulfates and chlorides of sodium and calcium. Geochemical soil catenas in the periglacial situations of the Antarctic and Tien Shan and in the humid subarctic situation of northern Scandinavia are investigated. Field data and literature are used to construct a typology of the world's principal geochemical soil catenas and their determinant factors. Analytical data on the mobile products of granite weathering, aqueous extracts from soils, and lake water at Bunger Oasis are tabulated.

E-12145
Rikhter, G.D.
SYSTEM OF NATURAL AREAL COMPLEXES OF THE EARTH. Soviet geography: review and translation, April 1970 11(4), p.252-255, Translated from: Akademiia nauk SSSR. Izvestiia. Seriia geograficheskaia, No.5, p.17-20, 1969. 7 refs.

The tiered vertical structure of all the earth's landscapes is used as the basis for a typological classification of all natural areal complexes. Four basic landscape divisions are proposed: (1) terrestrial landscapes, consisting of an upper aerial layer and lower mineral layer; (2) aquatic landscapes, consisting of three tiers: air, water, mineral base; (3) glacial landscapes, consisting of three tiers (air, ice, mineral) on land, and of four tiers (air, ice, water, mineral) in oceans; (4) variable landscapes distinguished by a periodic succession of structures (terrestrial-aquatic, terrestial-glacial; aquatic-glacial).

E-12158
DRILLING ON ROSS ISLAND AND IN FLOOR OF SOUTHERN OCEAN. Antarctic, Dec. 1972 6(8), p.276-277

An international team of 30 scientists from Japan, New Zealand, and the United States will drill a hole nearly a mile deep into the Antarctic bedrock on Ross I. during the 1972-73 season to help trace the continent's climatic and geologic history. In a parallel effort to the Dry Valley Drilling Project, the Deep Sea Drilling Project, a major ocean floor coring project supported by the National Science Foundation, will drill in Antarctic waters. Oceanographers aboard the drilling ship Glomar Challenger will concentrate on drilling and sampling the sea floor near that part of the Antarctic Continent south of Australia and New Zealand. The ship has equipment for drilling into the sea floor to a depth of at least 4000 ft, and has a dynamic positioning system which enables her to maintain station over the drilling site in oceanic depths.

E-12184
Orlando, H.A.
FOSSIL FLORAS OF WESTERN ANTARCTICA AND THEIR STRATIGRAPHIC RELATIONS. Las floras fosiles de Antártida occidental y sus relaciones estratigraficas. Buenos Aires. Instituto Antártico Argentino. Contribución, 1971 No.140, 12p., In Spanish with English, French, German and Italian summaries. 28 refs.

The mesozoic and cenozoic flora of the South

Shetland Islands, the Antarctic Peninsula and the neighboring islands are analyzed. Regarding the mesozoic flora, there is discussion about the age of the classic jurassic outcrop of Hope Bay, proposing Lower Jurassic and establishing correlation with Patagonia. There is also the disclosure of the finding of a new triassic fossil flora at Livingston I. and its relation with the Triassic of Argentina. The cenozoic flora is analyzed on the basis of the deposits at Ardley Peninsula, Admiralty Bay (bahia Lasserre) Potter Cove and Hennequin Point of the King George I. and related to those of Patagonia, Australia, New Zealand and Chile.

E-12201
Lindsay, J.F.
VENTIFACT EVOLUTION IN WRIGHT VALLEY, ANTARCTICA. Geological Society of America. Bulletin, May 1973 84(5), p.1791-1798, 12 refs.

Ventifacts occurring on extensive wind-deflated surfaces throughout ice-free Wright Valley, Antarctica, are the product of complex evolutionary processes. Initially, the wind removes the 2.0 to 1.5 phi grain-size fraction of valley soils to produce a lag gravel. The lag gravel then continues to evolve at a reduced rate as coarser granule and gravel fractions are removed. The morphology of ventifacts forming the lag gravels suggests that the distribution of wind-polish faces is determined largely by the shape of the original unpolished rock fragments. Once ventilation is initiated, the number of faces per clast declines rapidly as minor faces are removed by the polishing. As ventification proceeds, the trend is reversed as the ventifacts are reoriented by the wind and new faces form. At approximately 2.1 m.y. the number of faces per ventifact begins to exceed that of the original unpolished rock fragments. Salt weathering is also a major factor in determining the morphology of the Wright Valley ventifacts, proceeding more slowly than ventifaction; its effect are not apparent until approximately 0.5 to 2.1 m.y. (Auth.)

E-12233
Palmer, K.F. , Dalziel, I.W.D.
STRUCTURAL STUDIES IN THE SCOTIA ARC: ANDEAN CORDILLERA, TIERRA DEL FUEGO. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.11-14, 7 refs.

Geological studies along the southern coast of Seno Almirantazgo within the northern part of the east-west trending Andean High Cordillera in Tierra del Fuego and farther east in the Ushuaia-Lapataia area are reported. Throughout the area studied, the striking unconformity is apparent that has been observed throughout the southernmost Andes between an older schistose basement and a younger cover of volcanic and sedimentary rocks. Also, a strong fabric was imposed upon both the basement schists and the overlying cover rocks during the Late Mesozoic Andean orogeny. A pre-Andean foliation in the basement can be observed but has been largely obliterated. This contrasts strongly with northwestern Tierra del Fuego and the northwest Strait of Magellan area where no basement reactivation occurred. The most important conclusion of this work is that major thrust faults between the rock units, as envisaged by Kranck (1932) do not occur. Studies seem to confirm that the basement schists north of Cordillera Darwin crop out in the core of a compound major antiform that plunges eastward beneath the cover in the Monte Hope-Lapataia area. It may be inferred that the major phase of Andean deformation resulting in basement reactivation and the formation of the major compound antiform predate 82 m.y. throughout the Cordillera of Tierra del Fuego, and that this deformation was the cause of the known mid-Cretaceous uplift.

See also:
A-10039,A-10054,A-10167,A-10355, A-10357,A-10379,A-10988,A-11227,A-11753, B-10196,B-10261,B-10584,B-10587,B-10588, B-10594,B-10666,B-10667,B-10668,B-10759, B-10766,B-10931,B-11111,B-11116,B-11203, B-11210,B-11316,B-11391,B-11430,B-11573, B-11576,B-11624,B-11630,B-11704,B-11706, B-11764,B-11765,B-11882,B-11957,B-12006, B-12101,B-12113,B-12128,B-12219,B-12225, B-12229,C-10360,D-10646,D-11102,D-11676, F-10002,F-10017,F-10090,F-10101,F-10102, F-10103,F-10161,F-10246,F-10462,F-10886, F-11024,F-11091,F-11358,F-11457,F-11513, F-11584,F-11855,G-11438,G-11776,I-11490, J-10106,J-10189,J-10290,J-10293,J-10295, J-10296,J-10297,J-10298,J-10301,J-10366, J-10419,J-10421,J-10498,J-10767,J-10927, J-10930,J-10945,J-11025,J-11029,J-11086, J-11087,J-11088,J-11149,J-11215,J-11252, J-11254,J-11255,J-11256,J-11265,J-11270, J-11311,J-11312,J-11345,J-11492,J-11524, J-11525,J-11526,J-11533,J-11709,J-11710, J-11712,J-11714,J-11715,J-11716,J-11717, J-11718,J-11720,J-11778,J-11792,J-12139, J-12149,J-12240,K-11335,L-10056,L-10085, L-10470,L-10529,L-10536,L-10586,L-10592, L-10672,L-10741,L-10786,L-10824,L-10889, L-10895,L-11042,L-11043,L-11108,L-11249, L-11342,L-11359,L-11450,L-11735,L-11781, L-11794,L-11862,L-11918

F-10001
Chapman, W.H.
ADJUSTMENT OF THE BYRD STATION STRAIN NET, ANTARCTICA AND PROCEDURES FOR DETERMING STRAIN RATE. Columbus, Ohio State University, 1966, 142p., Thesis. 24 refs.

Measurements of the Byrd Station Strain Net have been carried out to obtain information on the movement and dynamics of the ice sheet, using a least squares method of adjustment. Strain rates are determined by surveying a network of stakes at two epochs, calculating the deformation from the differences in the observed or computed lengths and azimuths, and dividing this by the elapsed time. Principal direction and values of strain rate can be calculated for each triangle, the whole net, or some combination in between, such as a quadrilateral. Included are a brief history of strain-net measurements on ice sheets and the problems associated with such measurements; application of the geodetic survey method to strain net observations; measurements and computer programs resulting from the survey of the Byrd Station Strain Net; and plans and procedures for a resurvey of the Byrd Station Strain Net.

F-10002
Bauer, A. , Shumskii, P.A.
GLACIOLOGICAL INVESTIGATIONS AT KERGUELEN AND IN ANTARCTIA. Travaux glaciologiques à Kerguelen et dans l'Antarctique. Paris. Ecole pratique des hautes études. Centre d'études arctiques et finno-scandinaves. Contributions, 1970 No.8, 169p., In French with English summary.

Glaciers are found in seven distinct zones of the Kerguelen Is. They range in types from the very small cirque glacier to the large ice cap of Cook Glacier. The dimensions, total surface, hypsographic type, mean altitude, and general morphology are given for each group. The ice volume of Cook ice cap is evaluated by electric soundings and gravimetric measurements. Accumulation measurements are used to estimate the mass balance. Investigations of recent moraine systems lead to the conclusion that the glaciers of Kerguelen Is. are retreating. This report also contains two papers by P.A. Shumskii, both of which are French translations from the Russian: (1) Fields of Strain, velocity and temperature in glaciers; and (2) Glaciation of the Antarctic (see F-7971 for the Russian original).

F-10017
Mercer, J.H.
COLD GLACIERS IN THE CENTRAL TRANSANTARCTIC MOUNTAINS, ANTARCTICA: DRY ABLATION AND SUBGLACIAL EROSION. Journal of glaciology, July 1971 10(59), p.319-321, 3 refs.

At high elevations, independent glaciers with permanently dry ablation areas occur; ablation is solely by sublimation, except perhaps for a small amount of mechanical deflation. An example of such a glacier is on the NW side of Deathcock Peak, in the Caloplaca Hills adjacent to Reedy Glacier. No measurements were made on this glacier but, on a blue-ice distributary lobe of Reedy Glacier at a similar elevation, sublimation averaged 7.5 mm of ice/week between mid-Nov. 1964 and mid-Jan. 1965. This is a more extreme type of polar glacier than Meserve Glacier in the Transantarctic Mountains of S Victoria Land where about 55 percent of the ablation is by sublimation. Evidence is presented to show that large glaciers can both pluck and abrade their beds.

F-10024
Belousova, I.M. , Bogorodskii, V.V., Danilov, O.B., Ivanov, I.P.
STUDIES OF GLACIER DYNAMICS BY MEANS OF A LASER. Issledovanie dinamiki dvizheniia lednikov s pomoshch'iu lazera. Akademiia nauk SSSR. Doklady, Aug. 1971 199(5), p.1055-1057, In Russian. 4 refs.
AS262.S3663

The results of glacier flow measurements by a laser method on the Hays Glacier near Molodezhnaya Station from Dec. 10, 1969 to March 8, 1970, show that the duration of movements of the glacier is irregular. Oscillograms showed occurrence of independent pulsations of various frequencies within the range of 0.3 Hz and 10 Hz, which correspond to the calculated velocity of the glacier flow of 0.1 u/sec and 3.3 u/sec. The 2 frequencies indicate, apparently, that an advance of the glacier (low frequency spectrum) is accompanied by its deforming fluctuations (higher frequency spectrum). The method and equipment used for determining characteristics of the glacier movement are described in detail.

F-10027
Emiliani, C.
INTERGLACIAL HIGH SEA LEVELS AND THE CONTROL OF GREENLAND ICE BY THE PRECESSION OF THE EQUINOXES. Science, Dec.19, 1969 166(3912), p.1503-1504, 5 refs.
Q1.S35

The occurrence of high sea levels appears to be the result of significant melting of the Greenland ice cap after interglacial conditions are established and when northern summer solstice occurs at perihelion. Total melting would raise present sea level about 10m. In this context, Greenland appears more critical than Antarctica, apparently because it is not centrally located with respect to the pole and because it extends to considerably lower latitudes.

F-10028
Mercer, J.H.
ANTARCTIC ICE AND INTERGLACIAL HIGH SEA LEVELS. Science, June 26, 1970 168(3939), p.1605-1606, 4 refs.
Q1.S35

Mercer refutes Emiliani's hypothesis that high interglacial sea levels are the results of significant melting of the Greenland Ice Sheet (F-10027, 27-3002) and points out that Emiliani's dismissal of the Antarctic Ice Sheet as a factor in controlling interglacial high sea levels on the grounds that its situation in high latitudes and centered on the pole precludes significant

interglacial ablation is probably valid for about nine-tenths of the ice sheet -- that on the continent of East Antarctica -- but not for the ice cover that is grounded far below sea level in West Antarctica. Evidence is presented to show that if the high sea level was glacially controlled, it was mainly the result of the deglaciation of West Antarctica, not of Greenland. Emiliani replies that absolute dating shows perihelion coincidence for Greenland and anticoincidence for Antarctica, which confirms his original contention. However, West Antarctica could contribute by responding to albedo changes produced by events in Greenland.

F-10046
Naruse, R., Endo, Y., Ishida, T., Ageta, Y.
OBSERVATIONS OF SNOW ACCUMULATION AND SEA ICE AT SYOWA STATION, ANTARCTICA. Antarctic record, March 1971 40, p.57-64, In English with Japanese summary. 6 refs.

This report summarizes the results of observations of snow accumulation and sea ice at Showa Station from March 1967 to Jan. 1970, as part of the winter programs of the 8th, 9th, and 10th JARE. There was considerable variation of snow depth at the various stake locations, up to 120 cm. A maximum of about 1 m of snow was observed in the vicinity of the E. Ongul I. shore, but very little accumulation in the N. windward region. The maximum thickness of ice near Ongul I. was 110 to 140 cm.

F-10065
IGY World Data Center A: Glaciology
GLACIOLOGICAL NOTES. July/Oct. 1963-Oct. 1964 No.15/16-20

With issue No. 15/16, July/Oct. 1963 the IGY World Data Center published only a list of library acquisitions, including photographs and maps received each quarter. News of meetings, research, and field projects, formerly included in Glaciological Notes were sent to Ice which is issued by the Glaciological Society. Subsequent issues of the Notes contain numerous references to the Antarctic in the library acquisitions.

F-10066
World Data Center A: Glaciology
GLACIOLOGICAL NOTES. Jan. 1965-Oct.1970 No.21-44

The publication of notices of meetings and notes has been resumed and added to the list of library acquisitions in issue No. 21, Jan., 1965. Starting with issue No. 26, April, 1966, two new sections have been added, the Subject and Region listings, which appear immediately following, and keyed to, the main Acquisitions List. This arrangement is the result of merging Glaciological Notes and Catalogue of Data in World Data Center A: Glaciology. World Data Center A: Glaciology, which has been located at the American Geographical Society since 1957 is being transferred to the U.S. Geological survey in October 1970.

F-10090
Lliboutry, L.A.
CURRENT TRENDS IN GLACIOLOGY. Earth-science reviews, June 1970 6(3), p.141-167, 138 refs.

Glaciology has become a broad interdisciplinary science, which should no longer be considered as a subdivision of hydrology. Major contributions to glaciology during the last 5 years are reviewed and prognoses are made concerning lines of future research. The review is restricted to the following subjects: (1) Field techniques; (2) Geochemistry and mass balance of polar ice caps; (3) Flow law of ice; (4) Sliding of temperate glaciers and related problems; (5) Temperature profiles and past history of ice-caps; and (6) Glacier erosion and bottom drift.

F-10100
Budd, W.F.
LONGITUDINAL STRESS AND STRAIN-RATE GRADIENTS IN ICE MASSES. Journal of glaciology, Feb. 1970 9(55), p.19-27, 13 refs.
GB2401.J68

The fundamental equation for the longitudinal stress and strain-rate gradient for ice masses with small slope (Budd, 1968; F-6934) has been derived exactly for any slope by Nye (1969) who shows that by using a variable longitudinal axis inclination, parallel to the surface, this equation takes on its simplist form. However for the integration of this equation along the ice mass to obtain stress and strain-rates it is necessary to use a fixed axis direction. Here the equation is derived generally for a longitudinal axis of arbitrary inclination, from which the relation between the expressions for the fundamental equation with respect to any longitudinal axis inclination such as parallel to the surface, parallel to the base or horizontal, is readily discerned. An expression for the longitudinal strain-rate is derived to obtain the flow law from longitudinal stress and strain-rate measurements. A single "generalized viscosity function" is introduced to avoid the complication of both the power flow-law parameters varying with stress. (Auth.)

F-10101
Budd, W.F.
ICE FLOW OVER BEDROCK PERTURBATIONS. Journal of glaciology, Feb. 1970 9(55), p.29-48, 35 refs.
GB2401.J68

The use of well known simple periodic solutions of the two-dimensional biharmonic stress equation for studying the flow over undulations of an ice mass of small surface slope is examined. The model considered is one in which most of the shear (deformation or sliding) takes place near the base and the upper part moves largely as a block, with longitudinal strain-rates varying linearly with the longitudinal stress deviations. For bedrock perturbations of a given wavelength the steady-state surface shape consists of similar waves but out of phase by 1/2 pi, such that the steepest slope occurs over the highest bedrock; and the amplitude is recorded by a "damping factor", depending on the speed, viscosity, ice thickness and wavelength. Various predictions of the theory have been confirmed from spectral analysis of surface and bedrock profiles along a section of the Queen Maud Land Traverse, the Wilkes ice cap, and the E.G.I.G. (Greenland) profile. (Auth. mod.)

F-10102
STRESS VARIATIONS WITH ICE FLOW OVER UNDULATIONS.. Journal of glaciology, July 1971 10(59), p.177-195, In English with French and German summaries. 13 refs.

The analysis of steady-state flow over bedrock perturbations of Budd (1970; F-10101) is extended to evaluate the stress variations associated with the flow. In particular the four separate terms of the fundamental one-dimensional

(longitudinal) stress equation (Budd, 1968; F6934) are examined to show explicitly how the longitudinal stress gradient G, the base stress tau , the surface slope stress S, and the integrated second derivative of the shear stress T, all vary over a given wave. The result shows an error of a factor of 2 in some earlier studies relating longitudinal stress variations to the slope. This error resulted from the erroneous assumption that the basal stress remains constant at its regional value. In fact the basal stress varies over the undulations in a similar way to the longitudinal stress gradient, and this is the same as the surface slope stress for long waves, but for short waves requires the addition of the fourth term T, which then becomes dominant. (Auth.)

F-10103
Budd, W.F. , Carter, D.B.
ANALYSIS OF THE RELATION BETWEEN THE SURFACE AND BEDROCK PROFILES OF ICE CAPS. Journal of glaciology, July 1971 10(59), p.197-209, In English with French and German summaries. 22 refs.

Results are presented of spectral analyses of the surface and bedrock profiles along a flow line of the Wilkes ice cap and the surface along the Greenland E.G.I.G. profile. Although the bedrock appears irregular over all wavelengths studied, the ice-cap surface is typically characterized by a smooth curve with small-scale surface undulations superimposed on it. The following relations of Budd are confirmed. The "damping factor" or ratio of the bedrock amplitude to the surface amplitude is a minimum for wavelengths about 3.3 times the ice thickness. The surface lags the bed in the direction of motion by one-quarter of the wavelength. The magnitude of the minimum damping factor is typically least near the coast, and increases inland depending on the ice thickness, the velocity, and the mean ice viscosity (which is a function of stress and temperature). (Auth. mod.)

F-10119
Ivanov, B.B.
PHOTOMETRIC METHOD FOR STUDYING HEIGHT CHANGES OF THE SNOW COVER SURFACE. Fotograficheskii metod v izuchenii dinamiki izmeneniia vysoty poverkhnosti snezhnogo pokrova. Leningrad. Universitet. Vestnik. Geologiia-geografiia, Dec. 1970 24(4), p.69-76, In Russian with English summary
AS262.L463

Details on the photometric instrument used for continucus recording of height changes in the snow-cover surface in the Arctic and Antarctic are given, and the method of operaton is explained. In comparison with others, this device has some advantages, such as the ability to register sudden changes due to intensive snow melting and wind-blown snow deposition.

F-10146
Crary, A.P. ed
ANTARCTIC SNOW AND ICE STUDIES II. Antarctic research series, vol. 16, Washington, American Geophysical Union, 1971, 412p., For individual papers see 27-3009 through 27-3023 or F-10147 through F-10161. Numerous refs.

This volume of Antarctic Research Series represents an attempt to compile in one publication the remaining results of the extensive U.S. oversnow traverses in Antarctica between 1957 and 1967. From the beginning of 1957, the traverses, though including an assortment of observations, had two principal objectives: measurement of the thickness of the ice and measurement of the annual accumulation of snow. The old and new methods of approaching both objectives are considered. The discussions include subjective stratigraphic studies of snow layers, geophysical methods of measuring ice thickness, an outline of a possible history of the Antarctic ice sheet, progress in studies of particulates, and one of the first U.S. geophyical studies conducted in the neighborhood of Palmer Station in the Antarctic Peninsula.

F-10147
Bentley, C.R. , Chang, F.-K.
GEOPHYSICAL EXPLORATION IN MARIE BYRD LAND, ANTARCTICA. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.1-38, Contribution No.190, Geophysical and Polar Research Center, University of Wisconsin. 29 refs.

Seismic, gravimetric, altimetric, and magnetic observations made along oversnow traverses in Marie Byrd Land and vicinity in 1959 and 1960 have provided a reconnaissance picture of this part of West Antarctica. The ice sheet surface slopes gently from a high in the region of the Executive Committee Range southwestward to the Ross ice shelf, but elsewhere exhibits a more complicated topography affected by the rugged subglacial relief. The mountains of this region appear to belong to the plutonic and metamorphic province to the west. Throughout most of the region, there appears to be isostatic compensation for both the ice and the subglacial topography. Negative isostatic anomalies of -30 to -40 mgal occur near the Amundsen Sea coast, and associated with, but not superimposed upon, a subglacial trough in western Marie Byrd Land. (Auth. mod.)

F-10148
Beitzel, J.E.
GEOPHYSICAL EXPLORATION IN QUEEN MAUD LAND. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.39-87, Contribution No.224, Geophysical and Polar Research Center, University of Wisconsin. 27 refs.

Two reconnaissance traverses, South Pole-Queen Maud Land traverses 1 and 2, provided ice thickness and surface elevation data, as well as some information on the properties of the subglacial terrain. Electromagnetic soundings were used for the first time on a major Antarctic traverse, augmenting the seismic and gravimetric ice thickness determinations. The experimental use of distributed charges and arrays of multiple receivers successfully improved the signal-to-noise ratios of seismic reflection records. The ice surface slopes toward the Weddell Sea and is incised by a large ice stream. Magnetic measurements suggest that the rocks beneath the ice are probably not necessarily part of a crystalline complex. The ice sheet and subglacial relief together were found to be in isostatic equilibrium throughout most of the area. (Auth. mod.)

F-10149
Bentley, C.R.
SEISMIC EVIDENCE FOR MORAINE WITHIN THE BASAL ANTARCTIC ICE SHEET. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.89-129, Contribution No.227, Geophysical and

Polar Research Center, University of Wisconsin. 7 refs.

A low amplitude seismic echo reflecting from a horizon a few hundred meters above the bottom of the ice sheet has been widely observed in West Antarctica. The echo varies widely from place to place in amplitude, duration, and coherence, and in the indicated reflector dip. The weakness of the reflected signal, together with wave velocity information, indicates that the basal layer beneath the reflector is composed primarily of ice. The reverberative, incoherent, and variable characteristics of the reflections lead to the conclusion that they probably arise in most places from one or several bands of morainal debris within the ice. In a few instances, however, the source may be the upper surface of a zone of ice at the melting point. (Auth.)

P-10150
Bentley, C.R.
SEISMIC ANISOTROPY IN THE WEST ANTARCTIC ICE SHEET. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.131-177, Contribution No.228, Geophysical and Polar Research Center, University of Wisconsin. 32 refs.

Sixteen seismic profiles completed at fourteen stations between 1957 and 1961 have revealed the existence of extensive anisotropy in the West Antarctic ice sheet. Analysis based on refracted wave velocities and the angular dependence of mean velocities along reflection paths has shown that in many locations there must be significant differences from the vertical concentration of crystal c axes observed in the deep core from Byrd Station. Several more speculative inferences about the nature and extent of the anisotropy are also suggested. If the anisotropic models that are presented are even approximately correct and if the profiles are representative of the region, there is a tendency toward near-vertical axial orientation at small strain rates in the interior of West Antarctica and toward near-horizontal orientations associated with larger strain rates nearer the coast. At many stations there is evidence for a variation in mean axial orientation with depth; it is tentatively suggested that in general the fabric is relatively constant in most of the bottom half of the ice sheet, and that variations in the upper half and near the base are common. (Auth. mod.)

P-10151
Dewart, G.
GRAVIMETER OBSERVATIONS ON ANVERS ISLAND AND VICINITY. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.179-190, Contribution No.150, Institute of Polar Studies, Ohio State University. 5 refs.

Gravimeter and magnetometer observations were made in the region of Anvers I. and Bismarck Strait. The gravity data were used to estimate the regional gravity anomaly and the thickness of the Anvers I. ice cap. The gravity bases were tied to existing intercontinental networks through South America and the Antarctic Peninsula. The regional Bouguer anomaly was found to increase from +30 mgal along the southwest coast of Anvers I. to more than +50 mgal on the west coast. The ice cap in the southwestern part of Anvers I. was estimated to be largely between 300 and 600 m thick. It is underlain by a narrow coastal plain and a bedrock plateau approx 200 m high. A magnetic anomaly of more than 1000 gamma was found northeast of Palmer Station. (Auth.)

P-10152
Bentley, C.R.
SECULAR INCREASE OF GRAVITY AT SOUTH POLE STATION. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.191-198, Contribution No.222, Geophysical and Polar Research Center, University of Wisconsin. 16 refs.

A regular increase in observed gravity at South Pole station between 1957 and 1967 has been well established. The conclusion that a substantial part of this change is due either to a large horizontal movement of the ice sheet or to a secular decrease in ice surface elevation, however, does not stand closer examination. Observations and calculations indicate that at least 90 percent of the gravity change can be attributed to the sinking of South Pole station, partly in balance with the normal snow accumulation rate and partly in response to the superimposed load of the station-induced snow drift. A small contribution may arise from motion relative to the local surface slope. A model for the sinking rate of the station that is in satisfactory agreement with the observations is derived. (Auth.)

P-10153
Jiracek, G.R., Bentley, C.R.
VELOCITY OF ELECTROMAGNETIC WAVES IN ANTARCTIC ICE. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.199-208, Contribution No.186, Geophysical and Polar Research Center, University of Wisconsin. 15 refs.

The average velocity of 30-MHz electromagnetic waves in the Antarctic ice sheet was determined from primary and multiple echoes using standard reflection techniques. Measurements were made on the McMurdo ice shelf, the Skelton glacier, and Roosevelt I. together with the adjacent Ross ice shelf. The marked differences in the values of average velocity obtained in these areas are related to differences in average density of the ice column. Polar ice and snow can be considered as low-loss (loss tangent <1) at 30 MHz; therefore any measurement of the velocity of electromagnetic-wave propagation serves directly as a measurement of the relative dielectric constant. This facilitates the use of dielectric mixture theories to relate the density and geometrical structure of glacial ice to the wave velocity. It appears that the envelope of values predicted by O. Wiener's theory includes most velocity values when the relative dielectric constant of solid ice is taken as 3.21. (Auth. mod.)

P-10154
Taylor, L.D.
GLACIOLOGICAL STUDIES ON THE SOUTH POLE TRAVERSE. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.209-224, 23 refs.

Glaciological observations were made at 25 stations along a 1448-km over-snow traverse between the South Pole and the Queen Maud Mountains during the austral summer 1962-1963. Annual accumulation was determined from pit studies by the distribution of impermeable crusts, revealed by ink-staining pit walls, and the fluctuation in density of firn to a depth of 2 m. Ice crusts and permeable, low-density

layers of firn are formed by vapor transfer in summer (Dec. and Jan.) and late fall (Apr.) during periods of large temperature gradients on the Antarctic plateau. Ice crusts may also form during the summer by radiation. Stratification is complicated by disconformities. Accumulation varies from 6.8g/sq cm at the Pole to 10.8g/sq cm near the Queen Maud Mountains. Annual accumulation, mean density between 0 and 2 m, integrated ram hardness and 10-m temperatures in firn all decrease with increasing latitude between 87 deg 08 min S and 90 deg S. Annual accumulation, 10-m temperature, and mean density of firn (0-2 m) plotted against each other have linear correlations of 0.94. (Auth. mod.)

P-10155
Koerner, R.M.
STRATIGRAPHIC METHOD OF DETERMINING THE SNOW ACCUMULATION RATE AT PLATEAU STATION, ANTARCTICA, AND APPLICATION TO THE SOUTH POLE-QUEEN MAUD LAND TRAVERSE 2, 1965-1966. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed). Antarctic snow and ice studies II, p.225-238, 28 refs.

During Dec. and Jan. 1966-1967, the snow accumulation at Plateau station, Antarctica (79 deg 15 min S, 40 deg 30 min E), was examined at an array of 99 stakes, 114 shallow pits, three 1-m pits, one 2-m pit, and one 10-m pit. The annual layering in the snow stratigraphy can be divided into two parts: a thin, hard, fine-grained summer layer, and a softer, coarser-grained winter layer. It is concluded that the mean accumulation is 2.8 g/sq cm/yr. There is no evidence from the 10-m pit of any over-all change in the accumulation rate in the past 127 yr. The same stratigraphic criteria are applied to the snow stratigraphy observations from the South Pole-Queen Maud Land traverse 2 to determine the annual snow accumulation between the Pole of Relative Inaccessibility and Plateau station. The results are compared with accumulation rates based on the depth of the 1955 radioactive layer. The stratigraphic results generally overestimate the accumulation rate. However, the closeness of many of the results in the two sets indicates that a thorough investigation of the stratigraphy at every site can produce a reasonably accurate estimate of the accumulation rate. (Auth. mod.)

P-10156
Rundle, A.S.
SNOW ACCUMULATION AND FIRN STRATIGRAPHY ON THE EAST ANTARCTIC PLATEAU. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed). Antarctic snow and ice studies II, p.239-255, Contribution No.151, Institute of Polar Studies, Ohio State University. 10 refs.

The problem of determining annual accumulation rates, by stratigraphic analysis, on the East Antarctic plateau is discussed with reference to 168 shallow-depth pit studies and 18 radiochemical analyses. Results from these investigations are compared. A stratigraphic interpretation, based on known values of average annual accumulation, has been made, and a system of stratigraphic criteria has been established. Accumulation rates on the Antarctic plateau appear to be below the limit that permits a straightforward stratigraphic analysis, without information from stake and radiochemical measurements. (Auth.)

P-10157
Picciotto, E., Crozaz, G., Breuck, W. de
ACCUMULATION ON THE SOUTH POLE-QUEEN MAUD LAND TRAVERSE, 1964-1968. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.257-315, 48 refs.

Snow accumulation rates have been determined at 75 stations along the route of the South Pole-Queen Maud Land traverse (1964-1968), covering the area between approx 84 deg S and 74 deg S. Elevations ranged from 2726 to 3700 m. Estimates of the accumulation were based on laboratory measurements of the fission product radioactivity, identifying the layers deposited in early 1955. The lead 210 method was also applied at a few selected stations. The principles of these radiometric methods, as well as the experimental procedure, are fully described. The interpretation of the stratigraphy in terms of annual layers was found to be often ambiguous and sometimes impossible. It leads to overestimated values of accumulation. The 10-year average annual accumulation was found to vary from almost zero to 7 g/sq cm/yr. The average accumulation over the whole region investigated is 1.7 g/sq cm/yr. (Auth.)

P-10158
Cameron, P.L.
GLACIOLOGICAL STUDIES AT BYRD STATION, ANTARCTICA, 1963-1965. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.317-332, Contribution No.184, Institute of Polar Studies, Ohio State University. 12 refs.

A series of snow studies initiated at new Byrd station in 1961 and continued through 1965 included a 100-stake accumulation net, two excavations in the firn, an elongated pit, and a deep pit. In 1964 and 1965, an accumulation rate of 10.3 g/sq cm/yr was recorded at the stakes; in the 14-m long pit, the accumulation rate for the period of 1959 to 1963 was 13.7 g/sq cm/yr. On the wall of the long pit, 49 percent of the individual firn layers could be traced 14 m, 31 percent could be traced 7 m or more, and the remaining 20 percent were discontinuous. In the 10-m deep pit, vertical and horizontal strain rates were studied; the average vertical strain rate was 0.01032/yr. Correlation of the accumulation rate, using Sorge's law and the measured vertical strain rates, gave 10.4 g/sq cm/yr for the period 1925 to 1964. Snow accumulation at Byrd Station increased from 1948 to 1958 and has since been decreasing. (Auth.)

P-10159
Benson, C.S.
STRATIGRAPHIC STUDIES IN THE SNOW AT BYRD STATION, ANTARCTICA, COMPARED WITH SIMILAR STUDIES IN GREENLAND. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II, p.333-353, Contribution No.143, Institute of Polar Studies, Ohio State University. 25 refs.

The stratification exposed on the long tunnel walls during construction of new Byrd station, Antarctica, was studied in the 1961-1962 austral summer. The well-exposed sequences of strata showed good lateral continuity; annual increments of accumulation were in the range of 17 plus or minus 3 g/sq cm/yr. The rate of accumulation appears to have been changed from about 20 g/sq cm/yr between 1947 and 1954 to about 14 g/sq cm/yr from 1955 to 1961. The average accumulation rate at new Byrd was 1.1½ times greater than that determined at old Byrd by A.J. Gow. The differences in accumulation at these two stations, which are 15 km apart, are attributed to topographic features in the Byrd station area rather than to differences in the

amount of snowfall. The facies parameters at Byrd station are compared with parameters at six stations on the Greenland ice sheet that have comparable mean annual temperatures and rates of accumulation. The annual sequences of stratigraphy are similar, but the absolute density values are higher at Byrd station. (Auth. mod.)

[illegible]
Hamilton, W.L. , O'Kelley, M.B.
INVESTIGATION OF PARTICULATE MATTER IN ANTARCTIC FIRN. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed). Antarctic snow and ice studies II. p.[illegible]. Contribution No.91, Institute of Polar Studies, Ohio State University. 15 refs.

Frequency-size distribution data for water-insoluble microparticles in firn from C site, at the base of the Antarctic Peninsula, and from the South Pole are discussed and compared with measurements from other locations. At C site, the recent Annual mass accretion rate of particulate material appears to be relatively constant and independent of the annual snow accumulation. In general, higher density firn at the South Pole contains a higher concentration of particulate material than the lower density layers. Meltwater electrical conductance values for South Pole firn and corresponding values for salt concentration are given. The average dust concentration at Pole station is only 2.9 ppb. Annual accretion of particulate material and particle concentration in firn are related to elevation at the base of the Antarctic Peninsula and in the interior of the continent by inverse exponential functions. Precipitation at Byrd station was about 10 times dirtier in 1959 than in the years ca. 600 A.D., and the cleanest Antarctic surface snow far measured is about 2.6 times dirtier than the 600 A.D. ice. A recent large increase in atmospheric turbidity is indicated. (Auth. mod.)

P-10161
[illegible]
GLACIAL GEOLOGY OF THE VICTORIA VALLEY SYSTEM, SOUTH VICTORIA LAND, ANTARCTICA. American Geophysical Union. Antarctic research series, 1971 Vol.16, Crary, A.P. (ed), Antarctic snow and ice studies II. p.363-412. Contribution No.98, Institute of Polar Studies, Ohio State University. 81 refs.

At least two major glaciations, defined on the basis of deposits and land forms, are recorded in the Victoria Valley system. The first, the Insel glaciation, represents the strongest invasion of ice from the inland ice plateau and may have been preceded by one or more still earlier glaciations in this area. The second, the Victoria glaciation, was marked by many reversals in direction of ice flow, with a strong invasion of ice from local ice fields and from the coastal area. Weaker invasions from the inland ice plateau have been correlated with episodes of this last glaciation. However, because of the possibility that the latter are related to surges of the inland ice, this correlation is tentative. The Victoria glaciation has been subdivided into three "episodes," i.e., Bull, Vida, and Packard drifts, which involve glacial advances, stillstands, and retreats closely subordinate to and within the major advance and retreat comprising the Victoria glaciation. The last of these episodes extends to the present.

P-10166
[illegible]
"YOUNG" GLACIERS ARE MILLIONS OF YEARS OLD. "Molodym" lednikam -- milliony let. Zemlia i vselennaia. Nov.-Dec. 1970 No.6, p.70-71, In Russian.
QB1.Z47

World-wide data obtained from chemical analyses, stratigraphy and flow of glaciers were used for age determination of ice, chemistry of the atmosphere and paleoclimatology, including temperature variations for the last 10,000-30,000 years. The Earth is now undergoing a glaciation period, with Greenland and Antarctica almost completely covered with ice. Hypotheses of glaciations which occurred three times in a billion years, in the Cambrian, Permian and Quaternary periods, causes of glaciations, and possible glacial surges with ensuing effects on sea level, are discussed.

P-10197
Weiss, H.V. , Koide, M., Goldberg, E.D.
MERCURY IN A GREENLAND ICE SHEET: EVIDENCE OF RECENT INPUT BY MAN. Science, Nov.12, 1971 174(4010), p.692-694, 12 refs.
Q1.S35

The increased mercury content in a Greenland ice sheet over the last several decades suggests the dissemination of this element about the earth's atmosphere through the activities of man. The mercury content in the atmosphere appears to result primarily from the degassing of the earth's crust. Increased flux may come about as a result of the enhancement of this degassing process through the actions of man. Dated glacial samples from the Camp Century area and a single sample recovered from an inclined shaft at the New Byrd Station formed the basis of this work.

P-10215
Katsunoki, K.
ICE IN THE ANTARCTIC OCEAN. Marine sciences monthly, 1971 Vol.3, p.479-495, In Japanese with English summary.
GC1.K3

Characteristics of sea ice, including ice of land origin, in the Antarctic Ocean are summarized on the basis of recent observations made by many nations engaging in Antarctic research. The growth and decay of fast ice in the Antarctic are described briefly, making a comparison of Arctic and Antarctic sea ice. Distribution of pack ice is discussed in connection with atmospheric and oceanic conditions. Distribution, size, number, and drift of icebergs are also outlined. Importance of further observations and studies of sea ice and icebergs is stressed. (Auth.)

P-10222
Fujiwara, K. , Endo, Y.
PRELIMINARY REPORT OF GLACIOLOGICAL STUDIES. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.68-109, Ref.

Results are reported of glaciological studies carried out during the traverse between Showa Station and the South Pole in 1968-69 to investigate snow accumulation and snow conditions, as follows: (1) Measurements of temperature in the holes dug in the snow 10 m deep for seismic shots. (2) Observations of the relief of the snow surface at intervals of 2 or 4 km along the route. (3) Measurements of hardness and temperature on the surface layer of snow at intervals of 8 km between Showa Station and the

South Pole; and of density at intervals of 16 km between Showa Station and the Plateau Station. (4) Measurements of snow accumulation at intervals of 2 km along the route from Showa Station to the Plateau Station. (5) Stratigraphic studies in the 2 m pits dug at 44 sites.

F-10224
Murozumi, M. , Torii, T., Fujiwara, K.
SODIUM, POTASSIUM, AND MAGNESIUM CONCENTRATIONS IN POLAR SNOWS. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.113-114, Ref.

During the South Pole Traverse in 1968-69, ice cores were collected to a depth of 1 m at intervals of 50 km between the South Pole and Showa Station. The samples have been analyzed by the atomic absorption method and isotope dilution mass spectrometry. Concentrations of sodium, potassium, and magnesium were found to be at the ppb level in weight. Results are listed.

F-10226
Yoshino, T. , Eto, T.
RADIO ECHO SOUNDING OF ANTARCTIC ICE. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.125-130, 8 refs

The radio echo sounding measurements made during the JARE South Pole Traverse 1968-69 which gave results on group velocity of radio wave propagation through ice, dielectric constants, and ice density and temperature are discussed. The JARE ice Echo Sounder is described and results of measurements are given.

F-10236
Yoshino, T.
REFLECTION PROPERTIES OF RADIO WAVES ON THE ICE CAP. IEEE transactions on antennas and propagation, July 1967 AP-15(4), p.542-551, 13 refs.

Data on radio communication between Showa Station and Mawson, Roi Baudouin, Mirnyy, Byrd, Amundsen-Scott, and McMurdo Stations from Dec. 1958 to Jan. 1969 revealed that the large attenuation of radio waves reflected by the ice cap is due to the dielectric properites of the ice and snow, which are related to the frequency, density, temperature, and age of snow and polycrystalline ice. The measured value of the dielectric constant of snow and ice is 1.5 to 4.0, and the dissipation factor tan delta is 0.1 to 0.0002 with the frequency range from 1MHz to 1GHz. The propagation loss is calculated to be 0.07 dB/m. The magnitude of the reflection coefficient of radio waves on the surface for vertical incidence is about 0.1. It is shown that the large attenuation of radio waves reflected by the ice cap becomes an important factor similar to the attenuation of the ionospheric reflection.

F-10246
Brodie, J.W. , Dawson, E.W.
ANTARCTIC ICEBERGS NEAR NEW ZEALAND. New Zealand journal of marine and freshwater research, March 1971 5(1), p.80-85, 7 refs.

Records of icebergs sighted near New Zealand between 1888 and 1948 are noted, and their implications on the interpretation of ice-rafted sediments are discussed. The bergs reported were large and, though mostly irregular, included tabular bergs. Their survival at this distance from their Antarctic origin indicates either an unusually strong northward component in the dominantly circumpolar circulation in the West Wind Drift, or derivation from an ice shelf of considerable thickness. Glacial erratics showing striations and other possibly ice-rafted rocks have been recovered.

F-10248
Bulnitskii, V.Kh. , Dmitrash, Zh.A.
NEW METHOD FOR DETERMINING THE THICKNESS OF ANTARCTIC ICEBERGS. O novom metode opredeleniia tolshchiny antarkticheskikh aisbergov. Leningrad. Universitet. Vestnik. Seriia geologiia-geografiia, Sept. 1971 18(3), p.127-132, In Russian. 10 refs.

Methods of determining the thickness and volume of icebergs in the Antarctic and their shortcomings are discussed. Differences in measured and computed data are correctable by a new method of calculations, which requires only the height of the iceberg to determine thickness. The numerical analysis of a tabular iceberg illustrates the theory and methodology.

F-10249
Kudriavtsev, N.F.
SOME FEATURES OF FAST ICE GROWTH AT THE BEGINNING OF ICE FORMATION IN THE DRAKE PASSAGE. Nekotorye osobennosti narastaniia pripainykh l'dov v nachal'nyi period ledoobrazovaniia v prolive Dreika. Problemy Arktiki i Antarktiki; Sbornik statei, 1971 No. 38, p.92-97, In Russian. 5 refs.

Studies carried out by the 14th Soviet Antarctic Expedition in the Drake Passage near Bellingshausen Station from July 5 to Sept. 15, 1969, indicated continuous occurrence of water between snow and fast ice as a result of ice submergence under a heavy load of snow. The rate of ice growth at air temperature below 0 C was determined using data on snow and water layers over the fast ice, and initial ice thickness. Values of ice thickness computed by the "Minsk-22" compare favorably with observed data.

F-10262
International Meeting on Radioglaciology , Gudmandsen, P. ed.
PROCEEDINGS OF THE [2ND] MEETING, LYNGBY, MAY 1970. Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk felteteori. Report, Dec. 1970 R86, 170p., Refs.

The purpose of the second international meeting on radioglaciology was to review the state of the art and to enable the exchange of experience and ideas among research workers scattered all over the world. The meeting was attended by 29 representatives from 12 countries. Twenty-two papers were presented in sessions entitles: The dielectric properties of ice, Measurements on temperate glaciers, and Measurements on thin ice. For abstracts of selected papers see F-10263 to F-10267. Abstracts only appear in this volume for the following report titles: An Analysis of the Relation between the Surface and Bedrock Profiles of Ice Caps, by W.F. Budd and D.B. Carter; SPRI-NSF Radio Echo Flights in Antarctica 1969-70, by S. Evans; and On the Comparison of Electromagnetic and Seismic Sounding Depths, by C.R. Benthley and J.W. Clough.

F-10263
Bogorodskii, V.V. , Trepov, G.V., Fedorov, B.A.

[illegible] IN THE FIELD. Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report, Dec. 1970 R 86, International Meeting on Radioglaciology, [2nd], Lyngby, May 1970. Proceedings. Ed. by P. Gudmandsen, p.20-31

The following investigations of the dielectric properties of glaciers in the field are discussed: (1) measuring the vertical propagation velocity of electromagnetic waves in glaciers; (2) measuring the dielectric loss tangent; and (3) investigating the depolarization the radar signal undergoes as it travels from the aerial to a glacier bed and back. The measurements were carried out in the area of Mirnyy and Molodezhnaya stations. The results of investigations conducted by the 14th Soviet Antarctic Expedition on radar signal attenuation and the tensor properties of glaciers are included.

F-10266
Budd, W.F. , Jenssen, D., Radok, U.
CALCULATED DIELECTRIC ABSORPTIONS FOR ANTARCTICA AND GREENLAND. Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report, Dec. 1970 R 86, International Meeting on Radioglaciology, [2nd], Lyngby, May 1970, Proceedings. Ed. by P. Gudmandsen, p.71-80, 2 refs

Several maps are presented of the dielectric absorption calculations to date for the Antarctic and Greenland ice sheets. Some 300 Eulerian columns and 22 flowline calculations have been carried out for the Antarctic. The results from the 22 flowlines are presented in maps of (1) total (one-way) integrated absorption from surface to base; (2) integrated absorption to 1,000 m; (3) absorption per unit ice thickness; (4) absorption mean temperature, and (5) absorption + dispersion. For most of Antarctica the total one-way dielectric absorption is between 10 and 20 dB. The absorption in the top 1,000 m is less than 10 dB but increases rapidly towards the coast. Values for absorption + dispersion fall below the 120 dB level in East Antarctica but range from 150 to 170 dB in West Antarctica.

F-10265
Clough, J.W. , Bentley, C.R.
WIDE ANGLE REFLECTION MEASUREMENTS IN ANTARCTICA. Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report, Dec. 1970 R 86, International Meeting on Radioglaciology, [2nd], Lyngby, May 1970. Proceedings. Ed. by P. Gudmandsen, p.81-83, 1 ref.

Electromagnetic wave velocity determinations have been made in East Antarctica utilizing wide angle reflections. During the 1969-70 field season wide angle reflection measurements were conducted near Byrd Station. A common-reflection-point profile 1,100 m in length and two single-ended profiles 700 and 800 m long were obtained. Photographic records were made at 2-m intervals along each profile. Raypath analyses were undertaken in order to investigate the character of wide-angle reflection records and to aid in determining the velocity-depth functions. In addition, travel-time profiles were made for waves traveling one-way paths from a transmitter on the surface to receivers placed approx 42 and 21 m below the surface in an inclined shaft.

F-10264
Bogorodskii, V.V. , Trepov, O.O., Fedorov, B.

SOME ASPECTS OF RADIOGLACIOLOGY. Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report, Dec. 1970 R 86, International Meeting on Radioglaciology, [2nd], Lyngby, May 1970. Proceedings. Ed. by P. Gudmandsen, p.89-90

Radio echo sounding equipment and techniques, and their application to the measurement of glacier thickness in the Antarctic and Arctic are discussed. Several sets of radar systems, employed for different purposes, are described and compared. Sets 1, 2, 3, and 4 have operating frequencies of 213, 440, 100, and 60 MHz, respectively. Set 5 is a 5-frequency system operating at 70, 100, 140, 200, and 440 MHz. Set 1 has the advantages of narrow signal spectrum and hence narrow receiver bandwidth, a portable standard aerial, an amplification coefficient of 20, and convenience for installation on the IL-14 aircraft being used in the Antarctic. The use of radio echo sounding techniques has enabled the accumulation of data on the following properties of glaciers: inner structure and condition, dielectric heterogeneities, glacier mean temperature, stress condition, and motion. The use of radar systems in these investigations has made it possible to obtain profiles of glacier thickness more than 30,000 km long and to record the sub-ice profile of an area of more than one million sq km during 120 hr of flight.

F-10267
Autenboer, T. van , Decleir, H.
BELGIAN RADIO-GLACIOLOGICAL PROGRAMME IN ANTARCTICA. Copenhagen. Polyteknisk laereanstalt. Laboratoriet for elektromagnetisk feltteori. Report, Dec. 1970 R 86, International Meeting on Radioglaciology, [2nd], Lyngby, May 1970, Proceedings. Ed. by P. Gudmandsen, p.103-111, 1 ref

The 1969 Belgian Antarctic Expedition carried out a detailed airborne radio echo sounder survey of the Jelbartisen-Trolltungs area in western Dronning Maud land. A description is given of the personnel and equipment, navigation methods, wide angle velocity measurements, survey of the Fimbul and Jelbart ice shelves and the Blaskimen ice rise, and precision of the survey. A more detailed discussion of the survey can be found in another paper by the authors (1970; F-9284)

F-10269
Schmidt, T. , Mellinger, G.
DETERMINATION OF ICE MOVEMENT ON THE EDGE OF THE ANTARCTIC CONTINENTAL ICE. Bestimmungen von Eisbewegungen am Rand des antarktischen Inlandeises. Germany (Democratic Republic). Nationalkomitee für Geodäsie und Geophysik. [Schriften], 1966 3(4), 32p., In German. 9 refs. QE500.G47

Data obtained from measurements of the velocity of ice movement made in 1962 and 1965 along a triangulation net from Mirnyy Station S. to a 100-km mark are compared and the results are tabulated. A profile shows ice changes of up to 130 m horizontal movement and up to 6 m vertical movement. The methods and equipment used for glaciological measurements are discussed.

F-10362
Lamberge, J.H.
ROSS ICE SHELF PROJECT. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.258-263, 15 refs.

The Ross Ice Shelf Project will involve the drilling of a hole in the Ross Ice Shelf to

investigate the shelf ice, the underlying sea water, and the ocean floor. SCAR has appointed a specialist group on ice shelf drilling projects to offer guidance and advice to the Ross Shelf steering group of the U.S. Committee on Polar Research. The steering group met in Washington, D.C. on April 16, 1971 to discuss the scientific objectives of the Ross Ice Shelf Project and to review the status of the planning. Remarks based on the deliberations at the meeting cover a general project plan, planning map of the shelf, drilling techniques, glaciology, physical oceanography, marine biology, bottom sediments, deep coring, seismic soundings, and a tentative schedule for the field program.

F-10375
Dabberdt, W.F.
NEW MODEL OF THERMAL DIFFUSION IN A TRANSLUCENT MEDIUM. Boundary-layer meteorology, Jan. 1971 1(3), p.290-299, 13 refs.

The thermal diffusion equation is solved analytically for an ideally translucent and homogeneous medium with an internal, distributed heat source given by the penetration and absorption of solar radiation. The mean annual temperature profile has the coldest values at the surface; the mean annual flux of sensible heat out of the medium balances the internally absorbed solar radiation for the case of constant mean annual temperatures. A new formula is developed for the evaluation of the true thermal diffusivity of a non-homogeneous conductor from the Fourier components of the waves of insolation and temperature; a constant extinction coefficient is assumed. The new model is applied with moderate success to data from the coastal plateau ice at Mawson, Antarctica.

F-10410
Kikuchi, K. , Yanai, K.
OBSERVATIONS ON THE SHAPES OF SNOW CRYSTALS IN THE SOUTH POLE REGION IN THE SUMMER. Antarctic record, July 1971 No.41, p.34-41, 12 refs.

Replication of the shapes of snow and ice crystals was carried out at 6 stations in the South Pole region. Air temperatures during the observations were -27, -30, and -26C. The greater part of the snow crystal shapes were bullets, combination of bullets, columns, and side planes. In one case, however, bullets and columns were predominant and in another, only side planes were evident. This discrepancy in the occurrence of crystal shapes was ascribed to the difference in supersaturation with respect to ice surface between the crystals of bullet and columnar types and those of side planes. Measurements of the length of c-axis of single bullets and columns indicated a variation in frequency distribution; the distribution of the bullets was nearly normal and the other had two peaks at all stations. From this fact, it was conjectured that there were two layers of clouds in the upper atmosphere.

F-10412
Naruse, R. , Ishida, T., Endo, Y., Ageta, Y.
ON THE RELATION BETWEEN SEA ICE GROWTH AND FREEZING INDEX AT SYOWA STATION, ANTARCTICA. Antarctic record, July 1971 No. 41, p.62-66, 7 refs.

Relations between the thickness of sea ice and the freezing index observed at Kita-no-ura Cove and the Ongul Strait near Showa Station are represented respectively by empirical equations.

F-10413
Dort, W., Jr.
SHALLOW SUBSURFACE STRUCTURES OF EAST ANTARCTIC ICE SHELVES. Antarctic record, July 1971 No.41, p.67-80, 9 refs.

The features of many large tabular icebergs were observed aboard the icebreaker Fuji during its cruise along the Prince Olav Coast en route from Perth, Australia to Showa Station. The icebergs probably separated from the huge ice shelves located farther to the east, i.e., the Amery, West and Shackleton ice shelves. The sides of the ice cliffs exposed paired firn and ice layers which were interpreted as being the result of combined "summer" and "winter" net additions of snow during a single accumulation year. Scattered openings of various sizes, shapes, and locations observed in the icecliff faces could be categorized as sea caves, open crevasses, bridged crevasses, and tunnels. The firn layers and meltwater tunnels are believed to record brief variations in the mean annual temperature and the annual net accumulation of snow for a portion of the coast of East Antarctica at some time within the past few decades.

F-10436
Paren, J.G. , Walker, J.C.F.
INFLUENCE OF LIMITED SOLUBILITY ON THE ELECTRICAL AND MECHANICAL PROPERTIES OF ICE. Nature physical science, Mar.22, 1971 230(12), p.77-79, 30 refs.

The most soluble inorganic compounds in ice and NH4F, HF, and NH3. In equilibrium, a second phase is inevitable when the concentration of salts in the ice exceeds the solubility limit. In impure systems made from freezing sea water or a calcium chloride solution, the magnitude of the liquid signal at temperatures above the (lowest) eutectic temperature is in agreement with the thermodynamic theory of melting point depression. It is therefore surprising that PMR studies show that there is still a significant quantity of liquid in pure ice at -10 C. The impurity concentration in deposited snow is chiefly determined by geographical location and recent measurements on snowfall in Antarctica and Greenland have shown that the principal impurities are sea salts in the same ratio as in sea water, Cl being the dominant cation. At high impurity concentrations a second phase in the form of impurity segregated at grain boundaries in alpine firn and in temperate glaciers has been clearly established for a long time. The influence of this phase on the electrical and mechanical properties of ice as determined from observations made in the Arctic and Antarctic is discussed.

F-10437
Fedotov, V.I.
OBSERVATIONS OF THE ANTARCTIC FAST ICE. Ledoissledovatel'skie raboty na pripainykh antarkticheskikh l'dakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 No.300, p.110-120, In Russian. 28 refs. For translation see F-11772.

On the basis of information obtained from the Lena and Ob', on reconnaissance flights, and at coastal stations the features of Antarctic fast ice and problems in ice studies are discussed. The heterogeneous structure and numerous layers of different origins are the main reasons for the low strength of Antarctic fast ice. Data on the compressive and flexural strength, elasticity, and hardness of fast ice in East Antarctica can be used for navigation

purposes. A plan for further studies of the Antarctic fast ice is suggested.

F-10438
Kozlovskii, A.M.
FEATURES OF THE FORMATION AND STRUCTURE OF THE FAST ICE AT THE MIRNYY PIER AND IN ALASHEYEV BIGHT. Osobennosti formirovaniia i stroeniia pripaia na reide Mirnogo i v zalive Alasheeva. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 No.300, p.121-127, In Russian. 11 refs. For translation see F-11773.

Data on the structure, salinity, density, and flexural strength of sea ice, as well as snow accumulation and iceberg distribution in Alasheyev Bight in 1967 and in the Davis Sea in 1963 are given. The results show considerable differences in the structure and physical properties of fast ice due to different hydrometeorological regimes observed in each region not during but after the formation of fast ice.

F-10439
Fedotov, V.I.
DESTRUCTION OF ANTARCTIC FAST ICE BY SOLAR RADIATION. Radiatsionnoe razrushenie pripainykh antarkticheskikh l'dov. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy., 1971 No.300, p.128-136, In Russian. 24 refs. For translation see F-11774.

Data from previous observations were used to study the effects of solar radiation on the change and destruction of Antarctic fast ice and snow, including the influence of such other factors as radiation balance, solar altitude, air temperature, wind speed, and organic and inorganic impurities. As a result of artificial coal dusting at Molodezhnaya Station, melt water over the fast ice was about 30-40 cm deep in mid-Dec. This relatively warm layer of water (4-5 C) is a factor in the breakup of the underlying ice. Hence the navigable area can be increased in summer by means of coal dusting.

F-10462
Gow, A.J. , Williamson, T.
VOLCANIC ASH IN THE ANTARCTIC ICE SHEET AND ITS POSSIBLE CLIMATIC IMPLICATIONS. Earth and planetary science letters, Dec. 1971 13(1), p.210-218, 25 refs.

Approximately 2000 individual ash falls are preserved in deep cores from Antarctica. The bulk of the debris is composed of dust-size particles of glass that can probably be attributed to volcanic sources in Antarctica, though sources outside Antarctica cannot be entirely discounted. A period of sustained infall of ash occurred during the interval 30,000 to 16,000 years ago, the isotopic (paleotemperature) data from the same cores indicate that a significant cooling of the atmosphere over Antarctica occurred at the same time. This cooling trend did not terminate until deposition of ash had virtually ceased, suggesting possibly a cause and effect relationship involving the solar-depleting effect of volcanic dust in the Antarctic stratosphere. It is conceivable that widespread eruption of volcanic ash in Antarctica during the latter part of the Wisconsin may also have triggered world-wide cooling during this period effectively intensifying the existing glacial regime. (Autn.)

F-10474
Kotliakov, V.M.
SNOW COVER AND GLACIERS OF THE EARTH. Snezhnyi pokrov Zemli i ledniki. Leningrad, Gidrometeoizdat, 1968, 479 p., In Russian. 606 refs.

An analysis of data on snow and ice in glacier regions and in regions with seasonal cover, obtained since the IGY is presented in 5 chapters: (1) Basic methods in studies of snow cover on glaciers; (2) "Snowiness" of the Earth; (3) Snow cover on glaciers during the accumulation period; (4) Snow cover on glaciers in the ablation period; and (5) Present conditions for glacier feeding. The data used in the book were taken from: (a) an extensive number of publications of different countries; (b) IGY materials collected by the World Data Centers; (c) annual reports on snow cover; (d) climatic and other similar atlases; and (e) observations made in Antarctica, Novaya Zemlya, and the Elbrus and Tien Shan Mts.

F-10497
Khodakov, V.G.
SNOW AND ICE OF THE EARTH. Snega i l'dy Zemli. Moscow, Nauka, 1969, 163p., In Russian. 21 refs.

A non-technical presentation of glaciological studies made around the Earth, including the Arctic and Antarctic, is made in 5 chapters: (1) Snow and snow cover; (2) Glaciers; (3) Sea and river ice; (4) Permafrost and naleds; and (5) Glaciation of the Earth in the past.

F-10500
Bogorodskii, V.V.
PHYSICAL METHODS FOR GLACIER STUDIES. Fizicheskie metody issledovaniia lednikov. Leningrad, Gidrometeoizdat, 1968, 214p., In Russian. 112 refs.

GB2405.B64

Theoretical and experimental studies in the development of physical methods for glaciological research done by Soviet and non-Soviet scientists are summarized. Basic principles of magnetometric, gravimetric, acoustic, and radar techniques used in glaciological studies are discussed. Data are given on the structure, thickness, temperature, accumulation, morphology, and distribution of glaciers of the Earth, on meteorological conditions in the glacier regions, and on the relief of subglacial beds. Mechanical and electromagnetic properties of snow, firn, and glacier ice were studied and results are presented. New information on radio techniques of investigating the physical properties of ice and snow cover of Antarctica is given.

F-10537
Weertman, J.
GENERAL THEORY OF WATER FLOW AT THE BASE OF A GLACIER OR ICE SHEET. Reviews of geophysics and space physics, Feb. 1972 19(1), p.287-333, 56 refs.

QC801.R46

The theory of the flow of water at the base of a glacier is reviewed and extended. A detailed analysis is made of flow through Rothlisberger channels. (Rothlisberger channels are channels at the base of a glacier that are incised upward into the ice mass.) It is shown that, in general, a pressure gradient drives water melted from the bottom surface of a glacier away from Rothlisberger channels. Thus these channels are not good collectors of the water product at the bottom surface of a glacier or ice sheet. If Nye channels exist (Nye channels are

incised downward into the bedrock of a glacier bed), they should be important in the discharge of water at the base of a glacier. Nye tributary channels are expected to be spaced over several hundred meters apart. The analysis indicates that sheet flow is the main mechanism by which water melted from the bottom ice surface flows out of a glacier or ice sheet. The time required for water to upwell in the borehole drilled to the bottom of the Antarctic ice sheet under Byrd Station is used as evidence that a water sheet exists under the ice sheet. Although this argument is inconclusive, the slow upwelling time observed rules out the existence of a dense network of channels under the ice sheet.

F-10551
Fedorov, B.A. , Morev, V.A.
DOWN INTO ETERNAL ICE. V glub' tolshchi vechnyka l'dov. Chelovek i stikhiia, 1967, p.11, In Russian.
QC851.C39
Merits and demerits of the methods and equipment used in Antarctica for core drilling are briefly discussed. Working principles of the electrical thermal drill, developed at the Moscow Mining Institute and used in Antarctica in 1966, are described.

F-10559
Aver'ianov, V.G.
SNOW COVER OF ANTARCTICA. Snezhnyi pokrov Antarktidy. Chelovek i stikhiia, 1969, p.202, In Russian.
QC851.C39
Methods used for studies of snow accumulation and stratigraphy are briefly discussed and related to firnification and mass balance of the ice cover. Since the humidity in Antarctica is constantly very low, the rate of snow evaporation amounts to 200 mm per year in water equivalent. Snow accumulation varies from 50 to 900 mm per year, and mean values are from 100 to 180 mm.

F-10566
Harrison, C.H.
RADIO-ECHO SOUNDING: FOCUSING EFFECTS IN WAVY STRATA. Geophysical journal, Dec. 1971 24(4), p.383-400, 9 refs.
QC801.G382
An airborne radio-echo sounding system, employing a wide downward-looking beam, has produced records of the Antarctic ice sheet containing fault-like, near-vertical lines through the strata of partially-reflecting layers within the ice. It is shown that interpretation of these lines as near-vertical faults is in general incorrect, and a more plausible explanation is given developing the geometry of specularly reflected echoes from a stack of continuous undulating strata. An important condition is that the radius of curvature of the reflecting surface must pass from above the observer's path to below: thus the effect of varying observer height is predicted. The effects of refraction at the ice-air interface are a complication. Certain fading patterns may also be attributed to wavy layers. It is suggested that misinterpretation in terms of faulting is possible with any echo sounding technique such as sonar, marine seismic, and seismic prospecting, where multiple layering is present.

F-10589
CLIMATIC RECORDS FROM ICE SHEETS. Nature, Feb.25,1972 235(5339), p.417
Q1.N2
A correspondent reviews the report by Johnsen, Dansgaard, Clausen and Langway (F-10590) on the use of the oxygen isotope profile to record climatic changes in Antarctic and Greenland ice sheets. Potentially, the oxygen isotope values provide a more sensitive and more continuous profile of changes during the past 100,000 yr than is available by any other method. The efficacy of the method has been demonstrated by Dansgaard et al (1969; F-7230 and 1970) and Epstein et al (1970; F-8202).

F-10590
Johnsen, S.J. , Dansgaard, W., Clausen, H.B., Langway, C.C., Jr.
OXYGEN ISOTOPE PROFILES THROUGH THE ANTARCTIC AND GREENLAND ICE SHEETS. Nature, Feb.25,1972 235(5339), p.429-434, 37 refs.
The Camp Century, Greenland, deep ice core reveals seasonal variations in the isotopic composition of the ice back to 8,300 y.b.p. This is not the case for the Byrd Station, Antarctica, deep ice core. Both cores show long-term perturbations in isotopic composition reflecting climatic changes from before the beginning of the last glaciation. But the complexity of the glaciology regime at Byrd Station precludes a rational choice of a time scale. Pole-to-pole correlations of the palaeoclimatic data therefore become speculative except for the more pronounced features and general trends.

F-10602
Peschanskii, I.S. , IAkovlev, G.N., Nazintsev, IU.L., Shvaishtein, Z.L.
RESULTS AND PROSPECTS OF ICE STUDY PROJECTS. Itogi i perspektivy ledoissledovatel'skikh rabot. Problemy Arktiki i Antarktiki, 1970 No.36-37, p.116-134, In Russian. 69 refs.
A review is presented of glaciological studies in the Antarctic since 1957 and in the Arctic since 1944, at which time a special laboratory for ice study was created at the Arctic Institute. Methods, equipment, and icebreakers used to investigate ice properties under laboratory conditions and in situ for sea navigational purposes are discussed. Melting, strength, thickness, oscillation, structure, and texture of Arctic ice were compared to Antarctic ice. It was suggested to study ice not only as a physical body and a cover, but also investigate its relationship to hydrometeorological conditions and geographical location.

F-10631
TEN-YEAR INTERNATIONAL ICE STUDY PROGRAMME. Antarctic, Sept. 1971 6(3), p.106
G845.A55
A ten-yr concentrated program of collaborative glaciological studies of a sizable part of the East Antarctic ice sheet is planned by scientists from France, the United States, the Soviet Union, and Australia. The first stage of the International Antarctic Glaciological Project, which begins this summer, will include two traverses: a joint French and Russian 1000-mi traverse across Wilkes Land with the setting up of a station on the Polar Plateau, and a 900-mi traverse, following the route from Casey Station to Vostok Station, by the Australian National Antarctic Research Expedition. In addition to radio ice thickness sounding flights by a ski-equipped Navy Hercules, the United States will

provide logistic support for the ground parties sent out from Dumont d'Urville Station, transport scientists and cargo from Christchurch to McMurdo Station, and then to the small French station Carrefour, and establish a series of fuel depots along the ice-flow line between Dumont d'Urville and Vostok Stations. It is planned to carry out the research of the project in four phases, which are briefly summarized.

F-10644
•Robin, G. de Q.
POLAR ICE SHEETS: A REVIEW. Polar record, Jan. 1972 16(100), p.5-22, 10 refs.
G575.P6

The mechanisms of the Antarctic and Greenland ice sheets in relation to climate and shape of ground beneath are set forth in order to determine what causes the sheets to expand or retreat, and what effect the sheets have on climate, and on the circulation and level of the oceans. The relatively new techniques of radio-echo sounding and deep drilling of ice masses are compared with past methods and considered to be break-throughs to furnish data on ice characteristics for analysis by the steady state theory and isotope dating. In contrast to Budd and Radok, Robin concludes that the dimensions and movement of these ice sheets are close to being in balance with their present climatic environment.

F-10651
Zumberge, J.H.
REPORT ON THE ROSS ICE SHELF PROJECT (RISP). Polar record, Jan. 1972 16(100), p. 190-194
G575.P6

The Steering Group for RISP met in Wash., D.C. on April 16, 1971 for the first time. The group discussions and subsequent developments concerned the following: The U.S. Geological Survey should have available in the spring of 1972 a new map of the Ross Ice Shelf on a 1:1 000 000 scale. Three drilling sites were recommended to the JOIDES Antarctic Advisory Panel for inclusion in the drilling program for Glomar Challenger which becomes an acceptable alternate to the original plan of drilling through the shelf. Drilling equipment developed by CRREL will include a compressed air, reverse-rotary drilling rig that will produce a hole diameter between 30 cm and 1 m. Drilling of the pilot hole will be in the vicinity of 82.5 S and 166 W, 400 to 500 km back from the ice front. The scientific program in the pilot hole is outlined and discussed. The tentative field schedule for RISP during 3 seasons, from 1971 to 1974 is given, but is likely to be delayed by one year. The names and addresses of a SCAR Group of Specialists on Ice Shelf Drilling Projects are given.

F-10674
Paige, R.A.
STALACTITE GROWTH BENEATH SEA ICE. Science, Jan. 1970 167(3915), p.171-172, 6 refs.
Q1.S35

Fresh ice stalactites were observed beneath sea ice in Antarctica. They are hollow, tapering, inverted cones having a base diameter between 10 and 20 cm, and a tip diam of 4 to 10 cm extending downward about 100 cm. The stalactites form when dense, chilled brine drains downward from the ice sheet into seawater of normal salinity and near-freezing temperature. (Auth.)

F-10675
Kikuchi, K.
PECULIAR SHAPES OF SOLID PRECIPITATION OBSERVED AT SYOWA STATION, ANTARCTICA. Meteorological Society of Japan. Journal, June 1970 48(3), p.243-249, 16 refs.

A series of observations on the shapes of solid precipitation was carried out at Showa Station, Antarctica from the beginning of Feb. 1968 to the end of Jan. 1969. Observational techniques included direct observation by microscopic photograpy, the replica solution method, and snow crystal sonde observation by captive balloon. Unknown and peculiar shapes of solid precipitation were discovered. It is suggested that the majority of the peculiar shapes have some connection with bullets and the side plane shape snow crystals known hitherto. The minimum temperatures in clouds in which the peculiar crystals grew, as estimated from sounding curves, were higher than -35 C in almost all cases.

F-10676
Kikuchi, K.
OBSERVATIONS OF CONCENTRATION OF ICE NUCLEI AT SYOWA STATION, ANTARCTICA. Meteorological Society of Japan. Journal, Feb. 1971 49(1), p.20-31, 13 refs.

Observations of the number concentration of -20 C ice nuclei were carried out at Showa Station, from the beginning of Feb. 1968 to the end of Jan. 1969. Special attention was paid to the annual variation, the relation between meteor showers and the remarkable increases of ice nuclei, and the effect of pre-activation of ice nuclei. Three different methods were adopted, namely, the original, pre-heating, and direct methods. It was shown that the number concentration of -20 C ice nuclei increased in the winter season and decreased in the summer season in Antarctica. This means that the number concentration of ice nuclei increases when the observing station is under a condition of polar high pressure. The relationship between meteor showers and increases of ice nuclei was poor. Furthermore, it was indicated that there were a number of minute ice particles and pre-activated ice nuclei which acted as ice nuclei in the free atmosphere in the winter season in Antarctica and the number concentration of these may be higher than that of natural ice nuclei in the cold regions.

F-10682
Nagono, C., Kikuchi, K., Yamami, N.
ON THE METEOROLOGICAL CONDITIONS FOR THE GROWTH OF SNOW CRYSTALS IN COLDER TEMPERATURE REGIONS, AS REVEALED BY RADIOSONDE DATA IN THE ANTARCTICA. Meteorological Society of Japan. Journal, June 1971 49(3), p.179-183, 8 refs.

Observations were made of snow crystals by microphotography at Showa Station from Feb. to Dec. 1968. Results of analysis of cloud conditions, utilizing radiosonde data obtained at the observation site are reported. It was found that most of the crystals formed in temperature regions colder than -20 C, and that growth conditions almost overlapped, deviating slightly towards the higher supersaturation region. Small deviations are attributed to crystal habit. The humidity of the cold upper portion of a cloud layer was considerably lower than water saturation, although higher than ice saturation.

F-10727
Gjessing, T.T.
MASS TRANSPORT OF JUTULSTRAUMEN ICE STREAM IN DRONNING MAUD LAND. Oslo. Norsk polarinstitutt. Arbok, 1970 (Publ. 1972), p. 227-232, 3 refs.
G575.C78

An estimate is given of the mass transport of a 50 km wide ice stream in Dronning Maud Land. The cross section of the glacier is determined by a chain of 16 gravimeter stations, using an approximate ice-rock density difference on the calculated residual gravity anomalies. The velocities were determined by theodolite observations between the different gravimeter stations. The maximum ice thickness and velocity were found to be 1560 m and 390 m/yr respectively. The mass transport of the ice stream was established at 7.6 billion tons per yr. (Auth.)

F-10730
Budd, W.F.
DYNAMICS OF ICE MASSES. Australian National Antarctic Research Expeditions. Scientific reports, Ser. A (IV) Glaciology, 1969 No.108, p.204-209, Refs.
G845.A8

The theory of the dynamics of ice masses in general is developed, based largely on investigations of the Wilkes ice cap and the Amery Ice Shelf. The study involves establishing the equations of motion in terms of stresses, introducing the stress strain rate relation, or flow law, for ice and solving the equations of motion to obtain velocity distributions for the particular ice masses: glaciers, ice shelves, and ice caps. For cold ice masses the most important parameter governing the stress-strain rate relation is the temperature. The results of field measurements confirm the predictions of the equations for longitudinal velocity and strain rate. As a result, flow parameters are deduced which take account of calculated temperature profiles in the ice mass. The next step will be the measurement of the temperature distribution through the ice mass to examine the validity of using the calculated temperatures in the present flow analysis and to give information on the change in climate and the state of balance with time.

F-10735
Waters, O.D., Jr.
REPORT OF THE ANTARCTIC ICE OBSERVING AND FORECASTING PROGRAM - 1964. U.S. Naval Oceanographic Office. Special publication, May 1966 SP-80(64), 31p.

The ice program conducted by the U.S. Naval Oceanographic Office principally in support of Deep Freeze 65 Antarctic operations is presented in this report. Methods of data collection and dissemination, ice forecasting, forecast verification, and various allied ice projects are discussed. A summary of ice conditions in the Ross Sea and McMurdo Sound is given graphically for the period from October 1964 through January 1965.

F-10736
Bennett, H.F. , Bentley, C.R.
MEASUREMENTS OF ULTRASONIC WAVE VELOCITIES IN ICE CORES FROM GREENLAND AND ANTARCTICA. FINAL REPORT. 93p., AD-649 927, 56 refs.

The seismic and ultrasonic measurements through the snow and ice layers of Greenland and Antarctica (Byrd, Amundsen-Scott, and Little America Stations) in 1963-64 prove that their ice sheets display varying degrees of velocity anisotropy. Theoretical estimates of the velocity variation in materials with preferred crystal orientation (measured optically) are in essential agreement with sonic measurements through these materials. With the improved equipment and techniques presently available, it should be possible to utilize the wave theory in anisotropic media to gain additional knowledge about the mechanical structure of the ice sheet or other earth materials.

F-10737
Robinson, E.S.
SEISMIC SURFACE WAVE DISPERSION ON THE ANTARCTIC ICE CAP AND ADJACENT FLOATING ICE - A PRELIMINARY STUDY. Utah, University, Dept. of Geophysics, 1965, 33p., 15 refs.

This preliminary report includes a review of the available data on dispersive waves, tentative identification and qualitative description of various dispersive waves, and limited quantative analysis of some data. The quantitative analysis consists of comparisons of theoretical dispersion curves computed for multilayered structures with observed Rayleigh wave dispersion data. The data were recorded during three oversnow journeys, the 2500 km Ross Ice Shelf, the 1800 km McMurdo to South Pole, and the 1400 km South Pole Traverses and numerous local field trips in the vicinity of McMurdo Sound. The results of these preliminary studies show significant discrepancies between observed and theoretical dispersion, but indicate directions for further study which might lead to better agreement.

F-10768
Barkov, N.I.
SHELF ICE OF ANTARCTICA. Shel'fovye ledniki Antarktidy. Leningrad, Gidrometeoizdat, 1971, 226p., In Russian. 378 refs.

A summary of data on the Antarctic shelf ice published by Soviet and non-Soviet scientists up to 1968 is presented in 9 chapters: (1) Brief history of research; (2) Conditions for existence; (3) Morphology; (4) Accumulation; (5) Structure; (6) Temperature regime: (7) Movement; (8) Present conditions and development of shelf ice in the past; and (9) Classification.

F-10800
Post, A. , Chapelle, E.R.
GLACIER ICE. Seattle, University of Washington Press, 1971, 110p.
GB2403.P6

The aerial photographic reconnaissance technique as a tool of glaciology has enabled the documentation of the extent and character of glacierization. The material at hand has resulted in a collection of 128 photographs of glacier features together with explanatory text and glossary. Most of the photos cover W. North America; the others include mountain ranges extending to Antarctica. Thirteen sections deal with glacier dynamics, surface features, mass balance, and glaciation. The concluding photos in the book illustrate a few of the features of the smaller glaciers and ice sheets of North America as they appear in the grander scale of Antarctica at the Ross Ice Shelf, Byrd Glacier, nunataks, mountain ranges, and on the continental ice sheet.

F-10826
Kupetskii, V.N.

RELATIONSHIP BETWEEN ANTARCTIC SNOW ACCUMULATION, OCEAN LEVEL, AND SOLAR ACTIVITY. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.507-509. Translated from its Informatsionnyi biulleten' No.77, 1970. 10 refs.
Q115.S6862

Relative variations in the rate of alimentation of the Antarctic ice cover by atmospheric precipitation over the period 1880-1914, show a close correspondence to solar cycles. In general, snow accumulation increases with solar activity. Most glacier regimes are associated inversely with solar activity so that the dynamics of glaciation develops synchronously world-wide including Antarctica. Trends in the Atlantic Ocean show that the higher the solar activity, the higher the ocean level, and vice versa. Hence the expected decreased solar activity in the 11-yr solar cycles No.20, 21, and 22 will lead to an increase of snow accumulation in Antarctica, stabilization and growth of glaciers in both hemispheres, and a drop of the world ocean level.

P-10827
Kruchinin, IU.A.
ATTEMPT AT A GENETIC CLASSIFICATION OF THE MICRORELIEF FORMS OF ANTARCTIC GLACIERS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.510-512. Translated from its Informatsionnyi biulleten' No.77, 1970. 9 refs.
Q115.S6862

A genetic classification scheme, based on available data obtained from the first five Soviet Antarctic expeditions, represents types, sub-types, classes, and species of the microrelief forms of Antarctic glaciers. Each of two main types, eolian and thermogenic, is divided into two sub-types: accumulative and deflational; and ablational and cryogenic, respectively. Free and forced classes are distinguished within accumulative sub-type, and transverse and longitudinal sastrugi within deflational sub-type. Ablational sub-type is subdivided into two classes: tekogenic (occurs during ice and snowmelt) and diapneogenic (during evaporation). Seventeen species of the microrelief forms of snow and ice included in the classification table are briefly described.

P-10828
Lorius, C. , Merlivat, L., Hagemann, R.
FLUCTUATIONS OF THE AVERAGE DEUTERIUM CONTENT OF PRECIPITATION IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.513-516. Translated from its Informatsionnyi biulleten' No.77, 1970. 10 refs.
Q115.S6862

A relationship between the average deuterium (O-18) content of precipitation and the average annual air temperature in Antarctica was studied using the samples of snow accumulated over several years and collected in Victoria Land (Victoria Land traverse, 1960/61), in Byrd Land (Wisconsin University traverse, 1963/64), in Adelie Land and at Soviet stations in East Antarctica (9th Soviet Antarctic Expedition, 1963/64), and near South Pole, Byrd, and Scott Stations. Data on the deuterium content in snow as a function of average annual temperature are graphed. The temperature at a depth of 10 m where the amplitude of annual fluctuations is zero, was taken as the average annual air temperature at nearly all stations.

P-10833
Romanov, A.A.
ICE DRIFT CHARACTERISTICS IN THE COASTAL ZONE OF EAST ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.527-530. Translated from its Informatsionnyi biulleten' No.77, 1970. 14 refs.
Q115.S6862

The results of observations on ice drift near Mirnyy and Molodezhnaya Stations and in the Davis Sea are analyzed. Data from observations during which the deviations of the drift direction from wind direction did not exceed p/m 90 deg were used. The values of the wind coefficients and angles of deviation of the drifting ice from the wind direction depend upon the direction of the wind relative to the coast, but the orientation of the wind relative to the coast for regions examined varies because of different azimuths of the coastline. The drift coefficients vary within the limits of 0.020 to 0.032 and the angles of deviation of ice drift from the wind direction from 5 deg right or 35 deg left. Maximum drift velocities and minimum angles of deviation are observed during winds blowing along the coast; minimum drift velocities and maximum deviation angles during direction approximately perpendicular to the coast during which the effect of gradient currents is a minimum and the ice drift is close to the ice drift in the open sea far from the coast. The movement of icebergs which are deeply immersed, reflects the total effect of the wind and resulting current from the surface to the depth of iceberg immersion. Since a wind-driven current attenuates with depth, the speed of icebergs is 60-75 percent of that of ice drift and of surface currents. In some cases icebergs drift in the opposite direction from the wind drift of ice.

P-10835
Klokov, V.D.
FLUSHING OF WATER FROM LAKE GLUBOKOYE AT MOLODEZHNAYA STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.533-535. Translated from its Informatsionnyi biulleten' No.77, 1970. 5 refs.
Q115.S6862

On Jan. 18, 1969, the meltwater filling the basin of Lake Glubokoye breached the ice dam and rushed to the sea. The flow velocity of the lake water reached a maximum of 2.8 m/sec. The discharge of water up to 20 cu m/sec by the newly formed canyon produced a rapid drop in the level of the lake, changed the landscape of the oasis, and inflicted some material damage, which complicated work at Molodezhnaya Station. Observations show that the level regime of the lake is cyclic; each cycle consists of two stages: 1) a long period of filling of the lake basin with meltwater; and 2) a rapid discharge of water after the critical level, determined by the height of the dam, is reached. The hydrological regime of the dammed basin lakes and the activity of the glaciers, which form the dam, should be studied to forecast and prevent this type of phenomenon.

P-10843
Zamoruev, V.V.
OBSERVATIONS ON SNOW COVER DYNAMICS AT BELLINGSHAUSEN STATION IN 1968. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.573-574. Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862

Measurements of snow accumulation near Bellingshausen Station along a 1.5-km snow profile carried out every 10 days in 1968 and laid out to cover all main geomorphological elements of the area showed that Fildes Peninsula is an oasis completely free of snow from Jan. to April, a permanent snow cover occurring in mid-May. The maximum snow cover depth measured on the course was 290 cm and the maximum average depth was 89 cm on Oct. 7. The mean snow cover density was about 0.40. By the end of Dec. the continuous snow cover disappeared, and only individual snow spots remained. A comparison of the average monthly snow depth with the mean monthly air temperature and amount of precipitation reveals a close relationship between these factors.

F-10844
Shamont'ev, V.A.
CHANGE IN THE SHAPE OF THE WEST ICE SHELF. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.575-576, Translated from its Informatsionnyi biulleten' No.78, 1970. 5 refs.
Q115.S6862

A discrepancy was found in recent years in the location of the Antarctic coast on maps and the actual position of the shoreline in the region of the Chelyuskintsy Ice Tongue, located in the northwestern part of the West Ice Shelf. Airborne photographs taken in 1965 and 1968 show calving taking place and an ice fracture line running from NE to SW. Planimetric calculations indicate that the calved part measures 5,058 sq km, and a group of grounded icebergs occupies an area of 2,271 sq km. The Chelyuskintsy Ice Tongue had disappeared several years ago.

F-10848
Vorob'ev, V.N.
ICE REGIME CHARACTERISTICS IN THE BELLINGSHAUSEN STATION AREA IN 1968. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.583-586, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862

This preliminary description of ice regime is based on observations from Feb. to Dec. 1968 in the Bellingshausen Station area. Fast ice in the area reached greatest thickness, 90-100 cm at the coast and 80-85 cm 200 m away, during late Aug.-early Sept. Five layers of the fast ice distinguished by structure are described. The fast ice broke up during Sept.-Oct., by dynamic factors, waves and tides being decisive, almost without any traces of thawing, then its thickness was maximal. The station area was completely clear of ice at the end of Oct.-early Nov. Icebergs appeared occasionally, most passing to westward of the island in winter. The number of icebergs increased slightly in summer in the Bransfield Strait area.

F-10860
Morev, V.A. , Shamont'ev, V.A.
EXPERIMENTAL ICE DRILLING. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.620-621, Translated from its Informatsionnyi biulleten' No.78, 1970. 3 refs.
Q115.S6862

To make further improvements in electrothermal ice drilling equipment, all components were tested on the bench and in field tests by the 13th Soviet Antarctic Expedition in the Mirnyy area in 1968. The main testing was performed at the 26-km mark on the Mirnyy-Vostok profile from Aug. 22 to Sept. 17, 1968. A total of 386.5 m of ice were drilled, which indicated sufficient reliability and useful life for the drill and replacement parts. Data on ice temperature, measured at levels from 10 to 210 m, with a resistance thermometer and at the upper level with a mercury thermometer, show that ice temperature at the surface is -7.6C, while at 210 m is -24.0C. The snow, firn, and ice cores were sent to Leningrad for further analysis.

F-10871
Ageta, Y. , Naruse, R.
MEASUREMENTS OF ICE FLOW AROUND SKALLEN ROCK, SOUTH OF SYOWA STATION, ANTARCTICA. Antarctic record, Dec. 1971 No.42, p.61-64, 2 refs.

Surface velocities of ice flow were calculated from the changes of positions of six stakes set near the rock exposure area Skallen 70 km south of Showa Station. The positions of the stakes were measured with a Wild T-2 theodolite from two points on the rock, on Feb. 5, 1969, Oct. 12, 1969, and Feb. 4, 1970. A comparatively low mean value of 4 m/yr was obtained for the speed of ice flow observed at the six points. This slow speed may be attributed to the close locations of the stakes to the rock of Skallen which would retard the flow.

F-10877
Gow, A.J. , De Blander, F., Crozaz, G., Picciotto, E.
SNOW ACCUMULATION AT "BYRD" STATION, ANTARCTICA. Journal of glaciology, 1972 11(61), p.59-64, In English with French and German summaries. 11 refs.

The rate of snow accumulation at "Byrd" station, Antarctica, was measured by various methods. Surface measurements yield a mean accumulation of 117 kg/sq m/yr for the time interval 1962-70, within a 10 m radius of the station. The distribution of fission products with depth indicates a rate of 67 plus or minus 4 kg/sq m/yr for the period 1955-68 and of 100 plus or minus 10 kg/sq m/yr for the period 1965-68. The 210Pb method yields a 60 year average of 110 plus or minus 10 kg/sq m/yr.

F-10878
Smith, B.M.E. , Evans, S.
RADIO ECHO SOUNDING: ABSORPTION AND SCATTERING BY WATER INCLUSION AND ICE LENSES. Journal of glaciology, 1972 11(61), p.133-146, In English with French and German summaries. 19 refs.

The absorption of radio waves propagating through naturally occurring waters varies greatly with the electrical conductivity. Glacier melt water is very transparent and the attenuation by melt water layers is due to reflexion of power, whereas the attenuation of sea-water layers is due to absorption. The attenuation of soaked firn is usually prohibitive if the liquid is brine but it should not be a serious obstacle to radio echo strength if the liquid is rain-water or melt water. However, the magnitude of the scattered power can become greater than that from continuous (bedrock) reflectors if the size of the irregularities in the medium is large (approaching the radio wavelength in ice). Echo power formulae show that ice lenses may have the most serious effect and that low radio frequencies will be necessary to combat this.

F-10[illegible]
Hugh[illegible], T.
THERMAL CONVECTION IN POLAR ICE SHEETS RELATED TO THE VARIOUS EMPIRICAL FLOW LAWS OF ICE. Geophysical journal, May 1972 27(2), p.215-229, 21 refs.
QC801.G382

A more detailed analysis of the original application of thermal convection theory to polar ice sheets is made. This analysis considers the empirical flow laws of ice for a wide range of stress and temperature. A polynomial flow based on theoretical creep models gives the best representation of thermal stresses driving convection in polar ice sheets. The flow law also predicts ice viscosities which decrease rapidly with depth, and leads to supercritical Rayleigh numbers for the central portions of the Antarctic ice sheet. Ascending convection flow is visualized as confined to narrow, mushrooming diapirs perhaps regularly dispersed throughout the central portions of the ice sheet. Oriented crystal fabrics defining these diapirs may weaken from the centre toward the edge of the ice sheet; nevertheless the presence of diapirs should be detectable seismically by the vertical alignment of glide planes within them.

F-10886
Parkin, D.W. , Phillips, D.R.
PARTICULATE MATTER IN ANTARCTIC SNOW. Geophysical journal, May 1972 27(1), p.15-22, 10 refs.
QC801.G382

Dust particles larger than 1 micron have been settled out of 71.4kg of meltwater from a 30-year-old site at the base of the ice cliff at Halley Bay. The snow was returned in frozen blocks and sampling the interior of these blocks under clean room conditions gave about 1 microgram of 1-4 micron particles which are judged to be clay mineral naturally present in the snow. About 0.8 mg of sticky white organic matter, several dozen 100 micron particles of geothite and haematite 'paint' flakes and quartz were also found. These are believed to be contaminants. The concentration of clay mineral is about 1.4 x 10 exp -11/gg snow and the dust load in Antarctic air about 2.2 x 10 exp -5 microgram/cu m air. No black magnetic spherules were seen and nothing from outer space was recognized. The high nickel 'dissolved' in polar snow seems definitely extra-terrestrial, but the other elements may be land derived via Aitken nuclei of order 100/cu cm air, the global background.

F-10900
Kozlovskii, A.M.
MELTING OF CONTINENTAL ICE IN SEA WATER. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.409-411, Translated from its Informatsionnyi biulleten' No. 75, 1969. 6 refs.
Q115.S6862

Melting of freshwater ice was observed at three hydrologic stations in Alasheyev Bight near Molodezhnaya Station from Feb. to Nov. 1967. The method used in experiments on ice cores taken from icebergs is discussed. Data on the melting rate of ice samples of various densities, different water temperature at the surface and in the bottom layers up to 130 m, and under the effect of currents are given. From the results it can be assumed that the underwater part of icebergs and ice shelves is being continuously eroded thrcughout the year. Further and more accurate measurements are necessary to estimate the loss in large ice masses in contact with sea water.

F-10914
Aleksandrov, M.V.
STUDY OF THE EVOLUTION OF GLACIATION IN THE COASTAL BELT OF ENDERBY LAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.449-452, Translated from its Informatsionnyi biulleten' No.76, 1969. 3 refs.
Q115.S6862

The results of observations of slowly moving parts of the ice sheet in the ablation zone along the boundary between the ice and ice-free land of the Molodezhnyy Oasis were examined. Aerial photographs taken at the oasis in Feb. and May 1967 were studied to determine the state of the Antarctic ice sheet. In order to judge the general evolution of glaciation it is important to have information not only on the dynamics of the ice boundary but also on the variations in the height of the ice. In comparing data obtained in 1957 and 55 yr earlier, it was established that the ice surface in the vicinity of Gaussberg had lowered an average of 8.1 m. Glaciation was nearly stationary around Enderby Land, probably with brief periods of advance and recession.

F-10916
Romanov, A.A. , Ulitin, V.I.
SPATIAL VARIABILITY OF THE THICKNESS OF THE ANTARCTIC FAST ICE AND SNOW COVER DEPTH. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.457-459, Translated from its Informatsionnyi biulleten' No.76, 1969. 6 refs.
Q115.S6862

Data on fast ice and snow thickness obtained at Soviet Antarctic stations were used to select a location for a channel to be forced in ice by a ship and the route over the ice to transport the cargo from the ship to the coast. The properties of the spatial structure functions, studied on the fast ice 300 m from Cape Mabus in the Mirnyy area, are described. The spatial variability of the height of the snow cover and thickness of fast ice is insignificant in the initial period of formation of the ice cover. With growth of the ice, increase and redistribution of the snow cover, the spatial variability increases severalfold. The error in determination of the mean thickness of fast ice and height of the snow cover as a function of length of survey route and number of measurement points is calculated. The results show that the increase in length of the survey route and of the number of points does not always increase the accuracy of the calculation of the mean.

F-10918
Kozlovskii, A.M.
ESTABLISHMENT OF FAST ICE IN ALASHEYEV BIGHT. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.463-464, Translated from its Informatsionnyi biulleten' No.76, 1969. 1 ref.
Q115.S6862

A steady iceberg accumulation in the central part of Alasheyev Bight affects the formation and duration of the fast ice. Frequent katabatic wind breaks up new fast ice and carries it out to the central part of the bight, hampering the early formation of the fast ice near the shore. Ice surveys conducted on a profile between Molodezhnaya Station and the fast ice edge show that the thickness of the fast ice in the seaward part of the bight averages 20-30 cm more than in the shore area due to the early formation of

refrozen ice fields in the iceberg concentration zone.

F-10920
Vaigachev, A.Z. , Tret'iakov, N.F.
SHIFT IN THE POSITION OF POBEDA ICE ISLAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin. April 1971 7(5), p.468-469, Translated from its Informatsionnyi biulleten' No.76, 1969.
Q115.S6862

Pobeda I. discovered by the 2nd Soviet Antarctic Expedition in 1956, described as a large grounded iceberg, is approx. 25 m high and covers an area of about 1500 sq. km. and served as a landmark for tying in ice reconnaissance flight lines. In Feb. 1960 coordinates of an astronomic station established on the island by the 5th S.A.E. were 64 deg 39 min S and 98 deg 45 min E. According to observations performed by the 12th Soviet Antarctic Expedition in 1967 the island is an average 10-14 mi N of its former position, and has turned 25 deg clockwise.

F-10943
Buinitskii, V.Kh.
MOST IMPORTANT PROBLEMS IN SEA ICE RESEARCH. Oceanology, 1971 (Publ. May 1972) 11(5), p.689-694, Translated from Okeanologiia. 1 ref.
GC1.O3913

Results and problems of sea ice research in the Arctic and Antarctic are discussed. A radical reorganization of the observation system and extensive use of satellite observations are suggested. Sea ice remains a serious obstacle to navigation in polar seas. The breakup of fast ice and increasing its strength and lifetime for construction needs further study. In addition to the temperature, structure, stratigraphy, and thermodynamic parameters, the strength of sea ice is determined more accurately by considering a biogenic factor, the effect of microscopic algae. The study of sea ice as a unique natural system which can sustain and regulate itself has direct bearing on long-range forecasts of the climate of the Earth and its possible reconstruction.

F-10966
Savel'ev, B.A.
MANUAL FOR THE STUDY OF THE PROPERTIES OF ICE. U.S. Army Cold Regions Research and Engineering Laboratory, TL 343, April 1972, 225p., AD-741 870, For Russian text see SIP 22659. Numerous refs.

Chapters in the manual deal with: (1) The study of the structure of ice and snow by a recommended crystal optical method. Procedure is given for preparing snow and ice sections, photographic reproduction, and comparative evaluation of the results. A method which summarizes many structural elements in a single diagram is presented. (2) Methods of investigating the chemical composition of ice, melt water and brine. (3) Study of the liquid and solid phases of saline ice. (4) Methods of determining density and porosity. Special attention is paid to the method of radioactive logging used by A.V. Krasnushkin in 1959 in Antarctica. (5) Methods of analysis of gas inclusions in ice. (6) Basic methods of testing the strength of ice. (7) Study of thermal and radiation properties of ice.

F-10972
Bardin, V.I. , Suetova, I.A.
PERIMETER OF ANTARCTICA AND ANTARCTIC ICE SHEET BUDGET. Antarctic (Antarktika), 1971, p.105-121, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 30 refs.

A new calculation of the ice budget for the entire continent of Antarctica is made. For the purpose of accurate determination of the discharge through formation of icebergs, a careful measurement of the coastline was made which showed the length to be 30,030 km. The iceberg discharge is calculated for each type of glacial coastline (outlet glaciers, ice shelves, and continental ice barriers), the total of which is 1180 cu km/yr. Other sources of discharge are underwater melting from ice shelves (250 cu km/yr) and bottom melting in the central part of the ice cap (20 cu km/yr). The total rate of ice accumulation, 2420 cu km/yr, is compiled from the value calculated by the present authors for the Antarctic Peninsula and that given by Dolgushin, Evteev, and Kotliakov (1964) for the remaining part of the continent. A positive ice budget of 970 cu km/yr is obtained from these figures. The problem of establishing the accuracy of ice-budget calculations is discussed. The mean quadratic error for this determination is plus or minus 170 cu km/yr, or 20 per cent. For Russian original see F-4543.

F-10975
Lobodin, T.V.
CAUSES OF ELECTRIFICATION OF SNOW CRYSTALS DURING SNOWSTORMS. Antarctic (Antarktika), 1971, p.175-184, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 12 refs.

Continuous measurements were made at Mirnyy Station of the atmospheric electric field, space charges, and corona discharge currents. Based on the available information from various sources, an attempt is made to compare the various charge-generating mechanisms operant during snowstorms, and to evaluate their relative significances. An equation is given for Q max for a spherical snow particle with radius r. Factors in the equation represent: (1) the charge acquired as a result of collision with larger or smaller particles; (2) electrification of the crystal during its disintegration; (3) charge from random capture of atmospheric ions; (4) charge resulting from friction; and (5) charge arising during phase changes. After evaluation of these factors, the equation is represented in a simplified form with the elimination of (3) and (5) because of their relative insignificance. Likewise, charge losses due to atmospheric electric conductivity and corona discharge currents were not considered. For Russian original see F-4546.

F-10980
Zhantuarov, B.S. , Markov, K.K.
DYNAMICS OF THE ANTARCTIC ICE SHEET. Antarctic (Antarktika), 1971, p.221-249, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 46 refs.

Criticisms are made regarding the calculations made by P.A. Shumskii and S.A. Evteev (1963), based mainly on evidences from Drygalski I. and Gaussberg, which they believe prove the existence of a general ablation trend for the entire ice sheet (F-2513). It is felt that various calculations of the total Antarctic ice budget, which have generally indicated that the ice sheet is growing, are more likely to reflect the true situation. Recent investigations have shown that glacial retreat in one area is not necessarily accompanied by

retreat elsewhere on the earth, and in particular that warming trends are not uniform over the entire Antarctic. Futhermore, a warming trend beginning only in the 20th century would not be sufficient to warm the Antarctic ice sheet to any significant depth. For Russian original see F-4551.

F-10981
Shumskii, P.A.
CHANGES IN THE ANTARCTIC ICE SHEET. Antarctic (Antarktika), 1971, p.250-279, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 43 refs.

The arguments presented by R.S. Zhantuarov and K.K. Markov (F-10980), attempting to refute the position maintained by P.A. Shumskii and S.A. Evteev (1963) that the Antarctic icecap is receding, are answered. Zhantuarov and Markov express the opinion that the past 50-yr atmospheric warming trend would not have been sufficient for the warming of a glacier to any significant depth; Shumskii feels they have neglected to account for such factors as convection in calculating heat transfer. The method of determining icecap retreat or advance by calculating the total ice budget, which Zhantuarov and Markov feel has correctly indicated growth of the Antarctic icecap, is not considered sufficiently accurate. Further data are presented which may indicate glacial retreat within the 20th century, for instance, Lady Newnes and Amery Ice Shelves have decreased in area by 2500 sq km and 11,000 sq km, respectively; an 80-km ice tongue has disappeared from the Weddell Sea; and the Astrolabe and Zelee Glaciers have retreated significantly. For Russian original see F-4552.

F-10987
Bentley, C.R.
INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT. Antarctic journal of the United States, May-June 1972 7(3). Wisconsin. Univ. Geophysical and Polar Research Center Contribution No.284, p.50-52, 4 refs.
G845.A56

In May 1969, the International Antarctic Glaciological Project was formed in Paris to carry out a concentrated program of collaborative glaciological studies in the region bounded by 60 deg and 160 deg E, 80 deg S, and the antarctic coast, primarily in the 90 deg E area, the high dome of East Antarctica, and the Ross Ice Shelf. Major objectives of the project are to carry out a series of measurements along traverses that follow approximate flow lines from the ice divide in Central East Antarctica to Dumont d'Urville, Casey, and Mirnyy Station, and Byrd Glacier; to deep drill to and into bedrock; to study radio-echo mapping of ice thickness and surface elevation at a spacing of about 100 km throughout the entire region; and to observe ice margins by repeated aerial photography with ground control and geomorphological study of evident glacial action. Methods and priority of carrying out objectives are included in a "standardization" document. The U.S. has contributed to the first three objectives and provided logistic support while France, the Soviet Union, and the British Antarctic Survey have concentrated on developing new techniques. During the 1971-72 season Soviet and French traverse teams completed a portion of their field work.

F-10989
Dehn, W.S.
ANTARCTIC SEA ICE FORECASTING. Antarctic journal of the United States, May-June 1972 7(3), p.57-58
G845.A56

In 1970 the sea ice forecasting program of the U.S. Naval Weather Service Command was extended to include the Antarctic regions and the Fleet Weather Facility, Suitland, Md. designated to implement the program. Use of satellite imagery in the Arctic has drastically reduced the need for sea ice reconnaissance by aircraft, the U.S. Coast Guard icebreakers working winters in the Bering Sea being supported almost entirely by satellite and on-board helicopters. Since the makeup of ridges and general ice thickness in the Antarctic regions is not completely understood, aerial reconnaissance is still needed. After data on wind and current fields have been accumulated, computer techniques already developed can be applied to Antarctic forecasting. In the first two seasons of making Antarctic sea ice forecasts, ships operating there saved large amounts of time and distance after receiving ice advisories from the Fleet Weather Facility, Suitland. Forecasts have been transmitted to ships and stations of Argentina, Chile, France, Japan, and the U.S.

F-10993
Perchal, R.J.
REPORT OF THE ANTARCTIC ICE OBSERVING AND FORECASTING PROGRAM-1969. U.S. Naval Oceanographic Office. Special publication, Oct. 1971 NOO-SP-80(69), 123p., AD-737 410

The sea ice program conducted in support of the Deep Freeze 70 antarctic operations is presented. Methods of data collection and dissemination, ice forecasting, ice advisories, and allied ice projects are discussed. Ice conditions observed by aerial reconnaissance in the Ross Sea and McMurdo Sound from November 1969 to February 1970 are summarized. Ice conditions interpreted from satellite data generally by 1- to 4- day periods are also presented.

F-11013
Boling, G.R.
ICE AND THE BREAKER. Sea frontiers, Nov.-Dec. 1971 17(6), p.363-371
GC1.S4

Antarctic ice and the role of the icebreaker in the history of Antarctic and Arctic operations are discussed. Icebreakers, which may house 200-plus men in comfort, are capable of penetrating pack ice up to 15 ft thick. On the fringes of the Antarctic continent the ship's real work begins for some 600 mi of ice may lie between the ship and landfall. All but a small section of the Antarctic continent is covered with a thick layer of snow and ice the year round. The Antarctic ice sheet contains about 90 per cent of the world's ice and represents between 1 and 2 per cent of the earth's water. A 10,000-ton Russian ship, built in 1899 was the forerunner of today's modern icebreaker, which first came into full-time use by the U.S. Navy during WW II. Since that time they have provided service for several expeditions to Antarctic regions. Modern icebreakers carry helicopters to scout the ice fields. Scientists aboard the vessels in the Antarctic have been involved in research in meteorology, cosmic rays, solar activity, ionospheric physics, geomagnetism, oceanography, and glaciology. Although the last of the Navy's icebreakers was transferred, in Dec. 1966, to the Coast Guard, they still support the Navy logistically, keep major icebound arteries of commerce in the U.S. open, and contribute to scientific research.

F-11024
Binder, A.R.
BLACK AND WHITE ICEBERGS. Marine observer, Jan. 1972 42(235), p.15-16
QC851.M127

Approximately 180 distinctly colored icebergs were observed by the John Briscoe on March 22, 1971 from the Bransfield Strait to Signy Island in the South Orkneys. Twelve icebergs had two types of clearly defined portions of ice; a black or translucent greenish-black and the normal white color. Some of the bergs consisted of large areas of black and white; some consisted of many alternating bands; and some of the white ice appeared to be discolored by a brown sediment not connected with the black ice. All of the discolored bergs seemed to be inclined at 90 deg to the position in which they were originally formed and the layers of ice were vertical or near vertical. A note by Swithinbank indicates: (1) The black ice represents a layer in an ice shelf or iceberg tongue that became soaked with sea water and then froze which would account for the clean ice above and below the black ice. The bergs capsized so that the layer of black ice may be at any angle. (2) Alternatively the black ice represents what was formerly water at the bottom of the ice sheet, which would explain an occasional association of rocks and rock flour with the black ice, the water refreezing before the ice reached the edge of the ice sheet. The refrozen layer overriding more stagnant ice at the edge of the ice sheet would explain the white ice above and below the black ice.

F-11026
Gow, A.J.
DEPTH-TIME-TEMPERATURE RELATIONSHIPS OF ICE CRYSTAL GROWTH IN POLAR GLACIERS. U.S. Army Cold Regions Research and Engineering Laboratory, RR 300, Oct. 1971, 24p., AD-733 318

The growth of ice crystals as a function of depth and time in polar firn and glacier ice has been investigated at a number of locations in Antarctica and Greenland. Thin sections of snow and ice were used to measure crystal size variations. Crystal growth rates are strongly temperature dependent with growth being very much retarded at the lower englacial temperatures. At Camp Century, Greenland, where the firn temperature is -24C (constant below 10 m depth) crystals grow approximately 23 times faster than at Plateau Station, Antarctica, where the in situ temperature is -57C.

F-11031
Peden, I.C. , Webber, G.E., Chandler, A.S.
COMPLEX PERMITTIVITY OF THE ANTARCTIC ICE SHEET IN THE VLF BAND. Radio science, June 1972 7(6), p.645-650, 10 refs.
QC851.R3

The lower wall of the Antarctic earth-ionosphere waveguide is composed of rock covered by an ice sheet, the depth of which can be an appreciable fraction of a wavelength at very low frequencies. The complex permittivity of the ice cap is therefore an important parameter in connection with the prediction of propagation velocities and attenuation in the guide over long paths on the Antarctic continent. This paper describes an experiment conducted near Byrd Station during Nov. 1971, in which the properties of the surface magnetic field between 5 and 20 kHz were measured in the immediate vicinity of a buried 34-km dipole antenna just under the surface of the snow. The related analytical problem and data reduction process are described briefly to clarify the means for converting the data into bulk average values of the complex permittivity parameter of the ice over the frequency range of interest. The resulting dielectric and loss parameters are new and have not been determined before in connection with the Antarctic ice sheet.

F-11077
Bentley, C.R.
SEISMIC-WAVE VELOCITIES IN ANISOTROPIC ICE: A COMPARISON OF MEASURED AND CALCULATED VALUES IN AND AROUND THE DEEP DRILL HOLE AT BYRD STATION, ANTARCTICA. Journal of geophysical research, Aug. 10, 1972 77(23), Wisconsin, University. Geophysical and Polar Research Center. Contribution No.275, p.4406-4420, 8 refs.
QC811.J6

Ultrasonic (288 kHz) velocity logging was carried out to a depth of 1550 in the 2164-m drill hole at Byrd Station, Antarctica, in 1969-1970. Smoothed traveltimes from the logger chart were calibrated by taking spot measurements with a calibrated oscilloscope. As a result, velocities are accurate within about 10 m/sec throughout most of the log. Velocities at depths of <400 meters show an excellent correlation with density. Extrapolating velocities to the bottom of the ice on the basis of fabrics leads to a mean vertical velocity below the compaction zone 3915 m/sec, which is in satisfactory agreement with estimates from wide-angle reflection shooting at the surface but is about 2 1/2 percent higher than those commonly used in calculating ice thickness from reflection shooting. A very slow downward increase in the velocity calculated for horizontally propagating waves (0.02/sec) has been found to be consistent with both the effect of pressure on the solid ice and the results of detailed examination of refraction velocities. The velocities to a depth of 1000 meters appear to be very closely similar at two sites about 20 km apart near old and new Byrd stations.

F-11090
Knizhnikov, IU.F.
MODERN METHODS OF DETERMINING SURFACE VELOCITY OF GLACIER ICE. Sovremennye sposoby opredeleniia poverkhnostnoi skorosti dvizheniia l'da v lednike. Moscow. Universitet. Geofizicheskii fakul'tet. Informatsionnyi sbornik po Mezhdunarodnomu Geofizicheskomu Godu, 1970 No.15, p.151-165, In Russian. 19 refs.
QC801.3.M65

A classification scheme of methods used for measuring the rate of ice velocity in the Arctic and Antarctic glaciers is given. Two main methods (a method of determining the coordinates and a method of determining the dislocation of the ice surface) with modifications for several conditions are described and the advantages and disadvantages are discussed.

F-11091
Bennett, H.F.
MEASUREMENTS OF ULTRASONIC WAVE VELOCITIES IN ICE CORES FROM GREENLAND AND ANTARCTICA. U.S. Army Cold Regions Research and Engineering Laboratory, RR 237, June 1972, 55p., AD-745 904, Bibliography p.53-55

Detailed ultrasonic velocity measurements were made on snow and ice cores from Greenland and Antarctica in order to study velocity anisotropy and its relationship to the petrofabric analysis of these cores. In

addition, ultrasonic velocities were measured in the near-surface snow layers at Byrd Station and South Pole Station, Antarctica, to provide a detailed velocity profile in the region of the ice sheet where the velocity is greatly influenced by the snow structure. The experimental arrangement, including the design of equipment, measurement errors, techniques, and problems encountered in the study, is discussed. The theory of wave propagation in a general anisotropic medium is reviewed and a detailed presentation of this theory, concerning transversely isotropic media, is given. A method is developed for calculating a theoretical velocity model from the petrofabric analysis of the ice cores, thus providing a means of testing the theory with field and laboratory observations. Based on a comparison of the field and laboratory observations with the theoretical predictions, these conclusions were made: 1) the surface snow layers act as a high-frequency-cut filter on sonic wave propagation; 2) there is good agreement between the theoretical velocity models based on the petrofabric ice core analysis and the observed seismic and ultrasonic shear-wave velocity observations, but poorer agreement with the compressional wave velocities; 3) there is good agreement between the theoretical ray path calculations and the observed data in the near-surface anisotropic snow layers; 4) acoustic birefringence is demonstrated in the single ice crystal and observed in the ice sheets of Greenland and Antarctica; and 5) the ice sheets of Greenland and Antarctica display varying degrees of anisotropy.

F-11093
Evans, S.
RADIO ECHO-SOUNDING. Ice, Dec. 1964 No.16, p.1, 10-12
GB2401.I22

At the present state of development VHF radar apparatus requires a 12 volt power supply; the transmitter and receiver are independent of one another. The receiver contains calibrated attenuators which can be adjusted manually to measure and record the echo of interest. One oscilloscope is used as a monitor, and another is used with an intensity modulated display and a recording camera. The film is driven electrically from a bicycle wheel odometer so that distances along the traverse may be measured directly on the film. Advantages and disadvantages of various VHF radar instruments used for sounding the Arctic and Antarctic ice sheets are discussed.

F-11146
Smith, B.M.E.
AIRBORNE RADIO ECHO SOUNDING OF GLACIERS IN THE ANTARCTIC PENINSULA. British Antarctic Survey. Scientific reports, 1972 No.72, 11p., 14 refs.
QH199.B73

A Twin Otter aircraft of the British Antarctic Survey, equipped with a Scott Polar Research Institute Mark 4 radio echo sounder, made flights totaling about 10,000 km from Adelaide station and Fossil Bluff during the Antarctic summer 1969-70. The Larsen Ice Shelf was found to be 200 m thick at the ice front, increasing to more than 500 m in Cabinet Inlet and Mobiloil Inlet. On the Wordie Ice Shelf east of long 67 deg 50 min W., thickness were between about 150 m at the ice front and 400 m in the north-east at the foot of Hariot Glacier. Probable brine infiltration prevented widespread depth measurement in Wilkins Sound. In George VI Sound, in spite of extensive surface melt pools, soundings indicated a thickness of almost 500 m near lat 73 deg S, long 70 deg W. On the Antarctic Peninsula plateau, thicknesses up to 1,630 m were recorded. In the Weddell Sea a giant iceberg which is thought to have come from the Amery Ice Shelf was sounded. Tracks were plotted from flight-recorder data with a general purpose digital computer which also did the collation with the radio echo 35 mm film record. The data obtained are presented together with data collected during the 1966-67 season.

F-11148
Benson, C. , Harrison, W., Raymond, C., Meier, M., Shreve, R., Weller, G.
GLACIERS. American Geophysical Union. Transactions, March 1972 53(3), p.248-253, 115 refs.
QE500.A6

As part of the International Hydrological Decade the U.S. has contributed heat, ice, and water balance studies conducted in North American and Antarctic glacier basins since 1965 to obtain data on methodology and glacier-climate interrelationships. The studies are summarized and the topics discussed include the paradox of apparent discrepancies in water balance determination; interrelation of stratigraphic and annual systems of balance measurements; deformation, flow, and sliding of glaciers; and internal structures of glaciers. On instrumentation, developments and improvements are indicated in borehole drilling, deformation measurement, hole tracing and recovery, photographic and electrical recording, and remote sensing.

F-11156
Naruse, R.
MEASUREMENT OF DRIFTING SNOW ON THE COASTAL REGION OF ANTARCTICA, NEAR SYOWA STATION. Low temperature science (Teion Kagaku). Series A Physical sciences, 1970 28, p.147-154, In Japanese with English summary. 3 refs.

Snow-drift measurements using snow-traps were carried out in Aug. 1969 on the coastal region of the Antarctic continent, near Showa Station. From the vertical distribution of drift flux obtained by the snow-traps, the total drift snow transport at various wind speeds was calculated and compared with that of Byrd Station and Sapporo. Measurements of drifting snow and some meteorological elements were made on a snow field with a gentle slope, which was 12 km inland from the coast and at a 520 m elevation above the sea level. The snow surface of this site was hard wind-packed with few sastrugi or snow dunes. The annual net accumulation of snow in this region is 10 - 20 cm of water. The results of the calculations are given and a new Cyclone type of drift collector is illustrated in detail.

F-11157
Ishikawa, N. , Ishida, T.
EXPERIMENTAL STUDY OF LOCAL TEMPERATURE INCREASE IN SNOW AND ICE I. Low temperature science (Teion Kagku). Series A Physical sciences, 1970 28, p.165-173, In Japanese with English summary. 7 refs.

Semi-transparent media for radiation, such as snow and ice, absorb a portion of radiation and local temperature in the media gradually rises and finally internal melting may occur. Remarkable examples were seen in the ice shelves or sea ice in Antarctica, generally referred to as sub-surface melt pools or puddles. By supplying artificial radiation and wind on the upper suface of ice and snow blocks, 20 cm in

length, 20 cm in width and 15 cm in depth, the temperatures at various depths within each sample were continously recorded. From these temperature profiles attempts were made to determine what conditions should be satisfied for the local temperature increases in the sample. It was difficult to measure the surface temperature of the sample in a true sense, hence the temperature at a 0.5 cm depth was taken as the standard. When the temperature at a deeper depth was higher than the standard, it was considered that a local temperature increase had occurred. It is concluded that the problems of the local temperature increase in snow and ice can be approximately solved under a steady state condition, and even if in ice or snow layers there are no substances which specially absorb the radiation, a local temperature increase or internal-melting phenomenon of ice and snow may well occur.

F-11158
Endo, Y.
PUDDLES OBSERVED ON SEA ICE FROM THE TIME OF THEIR APPEARANCE TO THAT OF THEIR DISAPPEARANCE IN ANTARCTICA. Low temperature science (Teion Kagaku). Series A Physical sciences, 1970 28, p.203-213, In Japanese with English summary. 4 refs.

Observations were made on puddles forming in the ice field covering the sea water of the straits of Kitano-seto by members of the 9th Japanese Antarctic Research Expedition. The ice field was generally covered with about 50 cm of snow, but the snow was blown off by the wind and a narrow zone of the ice field remained uncovered during the whole year. The surface of the uncovered ice was flat and clear with white patches of bubbly ice (2-3 m in diameter) inlaid here and there. Puddles formed and developed in large numbers on the flat and clear parts, but few puddles were found in the white patches and on the general ice field covered with snow. Although the ice in the flat and clear parts was transparent when viewed from above, it consisted of two layers, namely the upper transparent layer and the lower opaque layer. The ice textures indicate that the transparent and the opaque ices were frozen from fresh water and sea water, respectively. The mode of formation of the puddles suggests that they are caused by sun light absorption in the interior of the ice.

F-11173
Dalinger, R.E.
THE PRESENCE OF ICE IN THE ANTARCTIC. La presencia del hielo en el Antartico. Antartida, Dec. 1971 No.1, p.56-60, In Spanish.

A general discussion of Antarctic ice examines Louis Agassiz's Ice Age Theory that the weight of ice during ice ages deformed the earth's crust; polar migration; ice types (fresh and brackish); and quantity and distribution of ice in the Antarctic cap. The movement of ice from the land mass to the sea -- pushed out by the force of its own weight -- is described. Many questions remain to be answered about Antarctic ice: volume, history, age, future developments, state of thermal energy -- despite the vigorous research efforts during and since the IGY.

F-11188
Pollak, W.H. , Sharwood, D.
GRAVIMETRIC DETERMINATION OF OCEAN TIDAL EFFECT ON THE FIMBUL ICE SHELF, PRINCESS MARTHA COAST, QUEEN MAUD LAND. South African journal of antarctic research, 1971 No.1, p.30-32, 8 refs.

The amount of vertical motion of the Fimbul Ice Shelf in Antarctica due to ocean tides was determined by use of a gravimeter and was found to be in the range of 0.70-1.65m. This agrees well with the theoretical average tidal range of 1.2m.

F-11204
Morgan, V.I.
OXYGEN ISOTOPE EVIDENCE FOR BOTTOM FREEZING ON THE AMERY ICE SHELF. Nature, Aug. 18, 1972 238(5364), p.393-394, 7 refs.
Q1.N2

During the 1968 Australian National Antarctic Research Expedition (ANARE) to the Amery Ice Shelf a borehole 315 m deep was drilled in the shelf. The ice core obtained has been analyzed for vatiations in the ratio of the isotopes of oxygen 0-18 and 0-16 expressed as the deviation of 0-18 (d) relative to standard mean ocean water (SMOW). The oxygen isotope profile suggests that the shelf consists of ice from three distinct sources. The uppermost layers from 0 to 70 m deep have d values from -19 to -23 per mille. These values are typical of snows deposited at low elevations near the coast of Antarctica and it is assumed that this ice was laid down by precipitation onto the ice shelf itself. The second section from 70 to 270 m appears to be ice which has flowed from the Lambert Glacier drainage basin. The very sharp change in the isotope values at 270 m appears to mark the bottom of the glacier ice; below this depth ice is assumed to be frozen on sea water. Values of d for this ice are close to that of ocean water (around 0 per mille), the slightly positive values resulting from fractionation occurring in the slow freezing process. Using measured velocities and distances and a total thickness of 428 m determined by ice radar an average bottom freezing rate of 30 cm/yr is calculated to accumulate the 158 m of sea water ice.

F-11214
Volck, C.
GLACIOLOGICAL STUDIES OF THE FRANCO-SOVIET TEAM DURING THE 14TH SOVIET ANTARCTIC EXPEDITION (SUMMER 1968-1969). Activités du groupe d'études glaciologiques Franco-Soviétique au sein de la 14e Expédition Antarctique Soviétique (été austral 1968-1969). France. Ministère d'Etat chargé des départments et territoires d'outre-mer. Terres australes et antarctiques françaises, Oct.-Dec. 1969 No.49, p.11-24, In French.
G845.F7

Franco-Soviet cooperation has been stimulated by the desire to verify the hypothesis of P. Shumskii and A. Bauer that the ice cap distribution can be determined by calculating the horizontal deformation vectors at surface, density of the top layers, and the total thickness. During the joint 1968-1969 mission to make these calculations, the convoy traveled 1500 km at altitudes up to 3,000 m and temperatures between -5C and -55C. Bedrock depths were determined with radar, and 900 kg of liquid and solid ice samples were taken. Equipment, personnel, preparations, and main events of the mission are described.

F-11219
Kapitsa, A.P.
THICKNESS OF THE ICE COVER OF THE CENTRAL REGIONS OF EAST ANTARCTICA. Geophysical bulletin, 1966

No.13, p.63-71, Translated from Geofizicheskii biulleten' No. 13:57-64, 1963. 7 refs.

The thickness of the Antarctic ice cover was measured along the Komsomol'skaya-Vostok-South Pole route in 1959, and processing of the data was completed by the end of 1962. Seismograms and oscillograms are described and interpreted. Station elevations and ice-sheet thicknesses based on seismic and gravimetric data, are tabulated. Two diagrams show the surface and subsurface profiles along the traverse routes. The data suggest the existence of a water layer beneath the ice sheet; water salinity studies near the postulated points of emergence of this water into the ocean may confirm this hypothesis.

F-11257
Endo, Y.
STRUCTURE AND TEXTURE OF GLACIER ICE CONTAINING ROCK FRAGMENTS. Low temperature science (Teion kagaku). Series A Physical sciences, 1971 Vol. 29, p.177-184, In Japanese with English summary. 8 refs.

Internal structure and texture were studied in an ice sample from a dark iceberg found floating about 10 km off shore at Showa Station. The ice contained an abundance of rock fragments smaller than 1 mm, which made the iceberg look dark. When the sample was cut into a plate 2 cm thick and looked at through transmitted light, black and white stripes appeared on its surfaces. Black patches in the form of small circles or flat ellipses seen on the cut surface showed transparent ice embedded within the dark ice containing rock fragments. The patches looked darker than the surrounding ice because the cut surface was examined under reflected light. Thin long cylinders of transparent ice, circular or elliptic in sectional circumference, and running throughout the sample parallel to one another were found to start from pebbles of about 1 cm in diam sparsely scattered in the dark ice. From the manner in which the cylinders of transparent ice start from the pebbles, it is supposed that the dark iceberg was subjected to shear flow for a long time while it was in a glacier before floating out into the sea.

F-11282
Marangunic, C.
GLACIOLOGY IN CHILE. La Glaciología en Chile. Instituto Antártico Chileno. Boletín, 1970 No.5, p.26-30, 4 refs.

One-third of Chile is snow-covered in winter and 50,000 sq. km. are covered with glaciers. Moreover, meltwater from snow and glaciers provides virtually all Chile's fresh water. Thus, the study of glaciers, the melting process, and snowfall becomes vital during droughts. It may be possible to create new glaciers by triggering avalanches to fill narrow valleys with snow and then controlling the surface temperature to prevent melting. At the same time methods of preventing avalanches on roads can be studied. Finally, the Antarctic ice cap, the basic factor in Chile's weather, must be studied further to find out, for example, whether its size is increasing or decreasing. The Chilean glaciological research effort must be centralized to enable scientists in the various fields concerned to work efficiently to solve these problems

F-11326
Hughes, T.
IS THE WEST ANTARCTIC ICE SHEET DISINTEGRATING?. Ice Streamline Cooperative Antarctic Project. ISCAP bulletin, June 1972 No.1, 77p. Bibliography p.56-66

The past and present ice cover of West Antarctica is investigated and it is concluded that during the last few million years the ice sheet has been retreating in stages, with each retreat stage preceded by an advance of comparable duration. Thus, disintegration of the West Antarctic ice sheet seems to follow the disintegration pattern of other continental ice sheets, and may be the last phase of the worldwide late Cenozoic ice age. At least some of the retreat stages seem to have been rapid enough to be called surges. It is tentatively concluded that the West Antarctic ice cover is presently unstable, and a retreat stage may now be in progress. An analysis of the grounded portion of the West Antarctic ice cover shows that data relating to the surface profile, ice velocity, and the mass balance are all incompatible with an equilibrium ice sheet. Instability seems to be centered in the major ice streams which drain Marie Byrd Land. An analysis of the floating portion of the West Antarctic ice cover shows that basal melting is most pronounced along the Siple Coast of the Ross Ice Shelf and causes retreat of the grounding line into Marie Byrd Land. Large scale basal melting and high Ross Sea salinities seem to require drainage of concentrated brine pockets trapped in Marie Byrd Land when the ice sheet last became grounded there. If so, brine drainage channels underlie the major ice streams of Marie Byrd Land and surges of the ice sheet may be related to collapse of large brine pockets.

F-11337
Budd, W.F. , Jenssen, D., Radok, U.
DERIVED PHYSICAL CHARACTERISTICS OF THE ANTARCTIC ICE SHEET. Australian National Antarctic Research Expeditions. Interim reports, Ser. A(IV) Glaciology, 1971 No.120, 178p., 70 refs.

A summary is presented of the results to date of a project aimed at calculating various unknow physical characteristics of the Antarctic Ice Sheet as a whole, from the data available. These characteristics include the temperature and velocity distributions, the age of the ice, the particle paths and patterns of flow, and the state of balance. The data used and the computed results are presented by a series of 36 plan maps of the Antarctic and a selection of vertical profiles along flowlines. The discussion includes large scale ice sheet dynamics, temperature calculations, a computer solution of the heat conduction equation, results of temperature calculations, vertical profiles along flowlines, and future programs aimed at improving output.

F-11338
Dubrovin, L.I. , Savatiugin, L.M.
FAST ICE DYNAMICS IN THE MIRNY AREA. U.S. Army Cold Regions Research and Engineering Laboratory, June 1972, 6p., AD-748 399, For Russian text see 26-1195 and Ant. Bibl.Vol.5, F-9592. 6 refs.

The conditions for formation and the morphological characteristics of fast ice in the Mirnyy region from March 21 to April 25, 1966 are described. Charts for the fast ice for several years show that deformations and fractures have occurred at the same places every year, seemingly caused by constant conditions of the same origin. A classification is given of tidal, wave, deflection, and horizontal tearing fractures caused by sea level fluctuations, sea swell, snow accumulation, glacier flow, icebergs, islands, and the coastal contour. The need for precise data on the fast-ice dynamics during ship

unloading and cargo transportation from ship to base is discussed.

F-11344
Ageta, Y.
SOME ASPECTS OF ABLATION OF SASTRUGI AND DRIFTS IN THE AREA SUBJECTED TO KATABATIC WINDS IN ANTARCTICA. Antarctic record, March 1972 No.43, p.8-19, In Japanese with English summary. 8 refs.

Observations were made on net ablation of sastrugi and drifts (like barchanoids) in an area subjected to strong katabatic winds between 100 and 200 km inland from the Antarctic coast near Showa Station in Sept. and Nov. 1969 and in Jan. 1970 by means of stake measurements. The net ablation of hard sastrugi during the period from Nov. to Jan. (mean 2.8 cm/mo) was larger than that from Sept. to Nov. (mean 0.7 cm/mo). The larger amount of ablation may be attributed to the increase of solar radiation which accelerates sublimation-deflation on the surface of sastrugi. On the other hand, net ablation of soft sastrugi and drifts from Sept. to Nov. was larger than that from Nov. to Jan. The larger amount of ablation may be attributed to the strong erosion by wind, since sastrugi and drifts were soft. Since the rate of ablation at the top of sastrugi and drifts was higher than that at the surrounding surface in late spring and summer, and the bulk of yearly accumulation is deposited in autumn and winter, it can be said that surface irregularities are supposed to be built up in winter, then smoothed in summer. The best season for yearly stake measurements is considered to be the end of summer when the more accurate value of mean net accumulation may be expected since surface irregularities are less than at any other season. (Auth. Mod.)

F-11357
Walford, M.E.R.
GLACIER MOVEMENT MEASURED WITH A RADIO ECHO TECHNIQUE. Nature, Sept. 8, 1972 239(5367), p.93-95, 6 refs.
Q1.N2

Field experiments are described in which the daily displacement of a site on the Flemming Glacier, Antarctic Peninsula was measured by the radio echo technique. The results are compared with a value obtained by conventional optical surveying techniques. A Scott Polar Research Institute Mark IV radio echo sounder was used transmitting at 40 microsec intervals, pulses 0.3 microsec long each containing ten cycles of 35 MHz radio waves. The radio wavelength in ice is 5 m. Eight lines each 7.5 m long and forming a fan shaped pattern were surveyed. The fading pattern along each line was recorded daily from Jan. 28-31, 1972. Fading patterns taken on successive days along a given line are similar, but are displaced upstream relative to markers in the ice, presumably because of downstream movement of the glacier. Corresponding features in comparable fading patterns were measured and the component of glacier velocity along each line calculated. A least squares analysis performed on a computer gives the value of the glacier velocity as 38 cm/day along 260 deg. Conventional optical surveying techniques to measure glacier velocity give the value 46 cm/day along 273 deg, which agrees satisfactorily with the value obtained from radio echo soundings.

F-11358
Boutron, C. , Echevin, M., Lorius, C.
CHEMISTRY OF POLAR SNOWS. ESTIMATION OF RATES OF DEPOSITION IN ANTARCTICA. Geochimica et cosmochimica acta, Sept. 1972 36(9), p.1029-1041, 29 refs.
QE351.G425

Analyses are reported of chlorine, sodium, magnesium, potassium, calcium, manganese and iron in ten surface firn samples collected along the profile Mirnyy-Vostok, and brought back to the laboratory in the frozen state. The analyses, carried out by atomic absorption after preconcentration in the presence of aqua regia and HF (Na, Mg, K, Ca and Fe) and neutron activation in the frozen state (Cl, to 0.1 ppb for Mn), are in good agreement with those published recently by Murozumi et al. (1969), Janappe (1970) and Vosters (1971) for other antarctic locations. Data published by Matveev (1961, 1962, 1964, 1970) for the axis Mirnyy-Vostok are, on the other hand, much higher. Cl and Na concentrations are shown to decrease as the distance from the coast increases and then to increase toward the central areas of Antarctica. The annual elemental deposition rates decrease from the coast to Vostok. The observed relation between these rates and accumulation rates permits an estimate of fallout on the entire Antarctic continent for six elements; the fallout rates vary between 200,000 tons/yr for Cl and 300 tons/yr for Mn.

F-11402
Breuck, W. de
QUEEN MAUD LAND TRAVERSE III. GLACIOLOGY. Columbus, Ohio State University, [1968], 10p. + 18 graphs

Snow samples were collected during the Queen Maud Land Traverse III for a detailed analysis of fall-out, lead-210, and oxygen isotopes. For each pit the data are presented in graphical form and indicate the vertical position of the oxygen and fall-out samples; ram hardness expressed in Kg; the stratigraphy, including the position of the crusts and the very loose and/or definite hoar layers; the grain size, with lowest and highest values for each layer; the density per section given in kg per cu m; the geographical position, and the corrected elevation.

F-11414
Ragone, S.E. , Finelli, R.V.
CATIONIC ANALYSIS OF THE BYRD STATION, ANTARCTICA, ICE CORE. U.S. Army Cold Regions Research and Engineering Laboratory, SR 180, Aug. 1972, 8p., AD-749 247, 18 refs.

Eighty-five ice samples taken from the Byrd Station, Antarctica, ice core were analyzed for Na, K, Ca2 ion concentrations by atomic absorption spectroscopy. From 168 to 1243 m of the portion of the ice core analyzed the mean Na, K, Ca2 and Mg2 ion concentrations were 21, 3, 2 and 3 micrograms/l respectively, increasing to 37, 5, 5, and 7 micrograms/l respectively from 1264 to 2090 m, then decreasing to 19, 4, 2, and 2 micrograms/l respectively from 2100 to 2153 m. The 1264 to 2090-m region represents snow accumulations deposited over the last 13,000 to 60,000 years, based on independent stable isotope analysis; this correlates roughly with the Wisconsin stage cold interval, 11,000 - 74,000 years before the present.

F-11435
Martin, S.
ICE STALACTITES AND THE DESALINATION OF SEA ICE. Naval research reviews, Sept. 1972 25(9), p.17-26, 4 refs.

Recent observations by scuba divers in both the Arctic and Antarctic Oceans show the presence

of large (0.5-6.0 m in length) ice stalactites growing beneath the pack ice. This article discusses these observations, compares them with some laboratory experiments, and describes both the ways in which stalactites form and grow, and their relation to the desalination of sea ice. It is found that the brine channel-stalactite combination provides three possible ways of natural desalination: (1) The growth in the diameter of the brine channel both entrains brine pockets and reduces the viscous drag of the outward flowing brine; (2) the pressure drop caused by the stalactite generates gravity drainage to the brine channel, and (3) the cooling of the ice surrounding the brine channel leads to brine expulsion to the drainage channel.

P-11441
AERIAL ACTIVITY PRECEDING THE 1964-65 ANTARCTIC EXPEDITION. Actividad aeronaval previa a la Campaña Antártica 1964-65. Buenos Aires. Instituto Antártico Argentino. Boletín, May 1965 2(17), p.13-15, In Spanish.

The Argentine Naval Air Force made three flights over the Drake Passage-Deception Island area in 1964 to survey sea ice conditions. Ice formations and distribution for Drake Passage, Bransfield Strait, Deception Island, the Antarctic Strait, and Weddell Sea are given for each of the 3 flights, which took place on Sept. 10, Oct. 6, and Nov. 12, 1964. Photographs of the ice are included.

P-11445
Breuck, W. de
APPARATUS FOR CUTTING ICE DRILL CORES. Un appareil pour découper les carottes de sondage dans la glace. Brussels, Presses Universitaires, 1962, 4 + 5p., In French with English summary.

A simple apparatus for cutting firn and ice drill cores is described. It is designed to cut longitudinal and transverse sections from cores of different diameters. The main parts are a carriage to support the samples, a circular saw driven by an electric motor, and a monoreflex 6 x 6 Hasselblad camera. The apparatus was used satisfactorily in 1961 at Roi Baudouin Station for a 115 m core. Technical details and photographs of the device are included.

P-11457
Solopov, A.V.
THEORETICAL RATE OF INTERACTION OF OASES AND GLACIERS IN ANTARCTICA. Teoreticheskaia otsenka protsessov vzaimovliianiia i vzaimodeistviia oazisov i lednikov v Antarktide. Antarktika; doklady komissii, 1969, pub. 1971, p.129-143, In Russian. 10 refs.
G576.A65

Processes of the interference and interaction between Antarctic oases and glacier ice, forming a common thermo-hydro-dynamic and hydraulic system, are discussed. A mathematical model was developed, an algorithm and IBM programs were established, and a numerical experiment was carried out as applied to Bunger Hills. Calculated data show that the heat effect of the oasis on adjacent glaciers occurs at a distance more than 50 km. Processes of turbulent exchange of heat, moisture and momentum were found to be highly developed over the oasis, due to the effect of surrounding glaciers.

P-11458
Belov, V.P. , Kornilov, N.A., Chikovskii, S.S., Baranov, IA.P.
MATERIAL BALANCE AT THE SNOW SURFACE AND THE DISTRIBUTION OF SNOW AND ICE COVER IN ALASHEYEV BIGHT. Balans snezhnoi poverkhnosti i raspredelenie snezhnogo i ledovogo pokrovov v zalive Alasheeva. Antarktika; doklady komissii, 1969, pub. 1971, p.144-156, In Russian. 7 refs.
G576.A65

Data on the distribution and accumulation of snow cover over fast ice in Alasheyev Bight near Molodezhnaya Station are given, and factors, under the effect of which the snow-ice cover is formed, are discussed. The primary components of the material balance of the snow surface over fast ice in and beyond katabatic-wind zones were determined for the first time in the Antarctic. The results of studies can be used in forecasting fast-ice break-up and in choosing the most favorable time for cargo operation in the sea.

P-11459
Belov, V.F.
OPTICAL METHOD OF SNOW TRANSFER DETERMINATION. Opticheskii metod opredeleniia perenosa snega. Antarktika; doklady komissii, 1969, pub. 1971, p.157-170, In Russian. 8 refs.
G576.A65

A theory of optical determination of the concentration of snow and ice particles suspended in snowstorm flow are discussed. Data on experimental studies of the visibility and spectrum of the suspended particles in snowdrift are given. An amount of the snow transfer from antarctic slopes to the shelf ice in a year was calculated. Instruments and a method for snow transfer calculation, using standard meteorological observations, are described. Tabular data obtained for snow transfer near Molodezhnaya Station from Feb. to Aug. 1966 are given as an example.

P-11476
Nye, J.F. , Berry, M.V., Walford, M.E.R.
MEASURING THE CHANGE IN THICKNESS OF THE ANTARCTIC ICE SHEET. Nature physical science, Nov. 6, 1972 240(97), p.7-9, 7 refs.
Q1.N22

A procedure is outlined for measuring the thickness change of the Antarctic ice sheet by radio echo methods. The returning echo consists, at least approximately, of a carrier wave within an envelope. The suggested technique is to use the envelope of the pulse, unmixed with the continuous wave, to establish position in the plane parallel to the rock bed, and then to use the envelope, after mixing with the continuous wave, to establish position in the vertical direction. The sensitivity in the horizontal and vertical directions is likely to be rather similar, and so in this way an (x,y,z) coordinate system can be set up, fixed relative to the bed and independent of visible landmarks, with a precision of a few centimeters. The displacement of features such as the snow surface, a particular firn layer, or markers set in the snow, can then be measured relative to this fixed frame.

P-11486
Mills, D.A.
ON WAVES IN A SEA ICE COVER. Flinders University of South Australia. Horace Lamb Centre for Oceanographical Research. Research paper, May 1972 No.53, 64+p.

A review of Arctic and Antarctic research on the ice-water interface is followed by an examination of waves generated on a ice-covered

sea by traveling, forcing effects. The idealised system comprises a thin flexible plate floating on an incompressible fluid of arbitrary depth, the transverse oscillations of which are governed by the forces of elasticity, mass inertia, and fluid pressure. The dispersive plane waves which may occur include those with critical speeds which are asscciated with increased plate deflection. For floating ice covers such as those in the Arctic and Antarctic, these speeds compare with those at which natural or vehicular forcing effects move. The nature of the waves generated and their patterns are predicted for various regimes of forcing corresponding to different travel speeds. The local response of the system to natural forcing is examined and the form of its power spectrum theoretically derived. It is shown that atmospheric micropressure systems, advected by the surface winds, are significant both in the direct forcing of the ice suface and in the reinforcement of existing waves.

F-11493
Gow, A.J. , Epstein, S.
ON THE USE OF STABLE ISOTOPES TO TRACE THE ORIGINS OF ICE IN A FLOATING ICE TONGUE. Journal of geophysical research, Nov. 20, 1972 77(33), California Institute of Technology. Division of Geological and Planetary Sciences. Contribution No.2148, p.6552-6557, 20 refs.
QC811.J6

Stable isotope analysis has been used successfully to distinguish between several different ice types in an ice tongue floating on sea water in Antarctica. At one critical location this technique has provided the only means of discriminating unambiguously between glacial ice and fresh-water ice formed from desalinated sea water. This part of the ice tongue is now underlain by a layer of desalted sea water thick enough to prevent any further accretion of sea ice at this location. (Auth.)

F-11494
Lile, R.
RHEOLOGY OF POLYCRYSTALLINE ICE: PROGRESS REPORT, SEPTEMBER, 1972. Melbourne, University of Melbourne, 1972. 3p.

As part of the general project to investigate ice creep, ice cores from Antarctica were subjected to pressures ranging from 1.5 bars to less than 1/100 bar at temperatures down to -60C. Stresses and strain rates were measured and deformations noted. Equipment used is briefly mentioned and laboratory techniques are indicated.

F-11504
Eskin, L.I.
SEA ICE DISTRIBUTION IN THE SOUTHERN PART OF THE INDIAN OCEAN. Raspredelenie morskikh l'dov v indookeanskom sektore IUzhnogo okeana. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.145-162, In Russian.
G860.S63

Results are discussed of sea ice observations made by the Ob' and on reconnaissance flights in the Davis, Sodruzhestvo, Kosmonavty, Riiser-Larsen and Lazarev Seas from 12 to 98 E in 1966-1967. Sea-ice profile data, including snow thickness, are appended.

F-11505
Eskin, L.I.
ICEBERG DISTRIBUTION IN THE SOUTHERN PART OF THE INDIAN OCEAN. Raspredelenie aisbergov v indookeanskom sektore IUzhnogo okeana. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.163-179, In Russian. 8 refs.
G860.S63

Observations on iceberg distribution made aboard the Ob' in the Riiser-Larsen, Kosmonavty, Sodruzhestvo and Davis Seas between 19 and 100 E in 1966-1967 are discussed. Tabular data are presented on date, ship's coordinates and number of icebergs on the Leningrad-Molodezhnaya, Molodezhnaya-Lazarev and Lazarev-South Africa routes. The results of studies indicate east-Atlantic and central-Indian zones of iceberg egress. The first zone covers a large area of water and has low concentrations of icebergs, while the Indian zone is a small area with high concentrations of icebergs.

F-11511
Petrov, I.G.
TEMPERATURE REGIME OF THE ICE SHEET ON THE MOLODEZHNAYA-POLE OF INACCESSIBILITY PROFILE. Temperaturnyi rezhim lednikovogo pokrova ot stantsii Molodezhnci do Poliusa Nedostupnosti. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.235-244, In Russian. 5 refs.
G860.S63

The vertical temperature profile through the snow-firn and ice cover between Molodezhnaya Station and the Pole of Inaccessibility was studied in 1967 in 8 boreholes at depths of 1, 2, 3, 5, 10, 20, 30, 40, and 50 m. Distances between the boreholes varied from 50 to 250 km. The depth of the active layer averaged about 10-12 m, the temperature below this level remaining practically constant, and varying only with elevation of the surface and distance from the coast. The vertical lapse rate of mean annual temperature in the east Antarctic glacier ice averages 1.57 C at depth of 100 m. The lowest ice temperature (-59.2 C) was recorded in the Cold Pole area.

F-11512
Petrov, V.N.
GLACIOLOGICAL OBSERVATIONS ALONG THE MOLODEZHNAYA-POLE OF INACCESSIBILITY PROFILE. Gliatsiologicheskie nabliudeniia na profile Molodezhnaia-Polius Nedostupnosti. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.145-154, In Russian. 13 refs.
G860.S63

The density, stratigraphy and accumulation of snow and firn and the depth of a tractor track were studied by the 12th Soviet Antarctic Expedition between Molodezhnaya Station and the Pole of Inaccessibility from Dec. 28, 1966 to March 26, 1967. The results show that at an elevation of 3500 m a sudden transition in values of the snow density and the depth of the track occurs: the density decreases towards the Pole of Inaccessibility from 0.38 to 0.35 gr/sq cm, while depth of track increases from 10-12cm to 40-50 cm. Data are given on the stratigraphy and accumulation of snow and firn obtained from 8 shafts (about 250 cm deep) and 22 boreholes (about 210 cm deep). Regular interchange of summer and winter accumulation of snow was noticed only in the northern part of the traverse. Instruments and methods used for glacial measurements are discussed.

F-11513
Trepov, G.V.
RADAR SOUNDING OF ANTARCTIC GLACIERS. Radiointroskopicheskoe issledovanie

antarkticheskogo lednika. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.255-262, In Russian. 4 refs.
G860.S63

To determine glacier characteristics radar sounding at frequencies of 100 and 440 Mc/s was used by the 12th Soviet Antarctic Expedition along the Mirnyy-30-km mark profile. The data indicate the ice thickness, morainic layers in the glacier ice, and subglacial relief along the profile.

F-11576
Egorov, G.V. , Lazarev, G.E., Maslennikov, A.S.
EFFECT OF VEHICLE SUBSIDENCE IN SNOW ON THE ACCURACY OF TRIGONOMETRIC LEVELING. Vliianie prosedaniia mashin v snegu na tochnost' trigonometricheskogo nivelirovaniia. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.276-278, In Russian.
G860.S63

Studies of vehicle subsidence in snow at triangulation points, carried out by the 4th and 6th Soviet Antarctic Expeditions, were continued by the 12th Soviet Antarctic Expedition between Molodezhnaya Station and the Pole of Inaccessibility. The results show different values of snow subsidence under vehicles throughout the route. The greatest daily subsidence (48 mm) was recorded at the 100-km mark away from Molodezhnaya Station, and 15mm between the 100-km and 800-km marks. The mean value of vehicle subsidence in snow at every point of the route was 5 mm. The systematic error in elevation of the final point of the 1650-km geodetic traverse was assumed to be about one meter.

F-11545
Zavatti, S.
POLAR GEOGLACIOLOGICAL TERMINOLOGY. Terminologia geoglaciologica polare. Istituto geografico polare. Pubblicazioni scientifiche, 1969 No.6, 20p., 19 refs.

Terms are alphabetized in English followed by explanations in Italian and the corresponding terms in Italian, French, Spanish, German, Russian, Danish and Norwegian.

F-11552
Acharya, H.K.
SURFACE-WAVE DISPERSION IN BYRD LAND, ANTARCTICA. Seismological Society of America. Bulletin, Aug. 1972 62(4), p.955-959, 12 refs.
QE521.S3

Assuming constant density and Poisson's ratio of 0.25, theoretical surface-wave dispersion has been computed for the Byrd Land area in Antarctica, where the velocity increases monotonically with depth. Comparison with observed dispersion indicates 8 to 10 per cent anisotropy in the ice cap. Such anisotropy was also detected from ultrasonic velocity measurements on snow cores. (Auth.)

F-11584
Orheim, O. , Bull, C., Schytt, V.
GLACIOLOGICAL STUDIES OF PAST CLIMATIC VARIATIONS IN THE SOUTH SHETLAND ISLANDS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.99-100, 2 refs.
G845.A56

Glaciological studies were carried out from Jan. 10 to Feb. 2, 1972 at Deception and Livingston Is. The work at Livingston I. included studies of the shear-plane moraine ridges that border the western edge of Rotch Dome. The main result of the Deception I. study has been the establishment of the annual mass balance variations of the island from about 1680 A.D. to the present. Recent analyses of this record show that short-term mass balance variations in the Northern and Southern Hemisphere are negatively correlated. The Deception I. mass balance record has been confirmed for the period from 1946 to the present and is the only precise mass balance record from the Southern Hemisphere for this period. Comparisons of meteorological data suggest an anticorrelation between summer temperatures in middle to high latitudes in the Northern and Southern Hemispheres.

F-11585
Bow, A.J.
GLACIOLOGICAL INVESTIGATIONS IN ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.100-101
G845.A56

A number of glaciers along the southern foothills of the Royal Society Range were visited during Nov. 1971 to investigate the debris patterns in the glaciers and the mechanisms of their emplacement. The sites visited included Malcott, Adams, Miers, Joyce, Garwood, Hobbs, Blue, Commonwealth, and Taylor Glaciers. All of the glaciers contained laminations made up of fine sand and dust. Additionally, the Garwood, Blue, and Taylor Glaciers contained thick sequences of sand and gravel intercalated with bubbly glacial ice. Snow stakes were remeasured at Byrd Station. Snow accumulation within a 10-km radius of Byrd, measured over the past 10 yr, approximates a mean value of 11.7 gm per sq cm per yr.

F-11586
McSaveney, M.J.
OGIVE SYSTEMS ON POLAR ALPINE GLACIERS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.101-102, 4 refs.
G845.A56

In order to test ogive formation under polar alpine conditions, closely spaced strain networks were erected on the ogive train of Meserve Glacier, deep and shallow boreholes were placed within these networks, ice samples were taken for fabric studies, and areal variation in ablation was studied. It was found that the Meserve Glacier ogive train is not a single train of waves but a system of two interdigitating trains symmetrically disposed about the centerline. Ogive trains of polar orientation were also observed on adjacent glaciers. Strain variation over ogive systems is large.

F-11591
Evans, S. , Robin, G. de Q.
ICE THICKNESS MEASUREMENT BY RADIO ECHO SOUNDING, 1971-1972. Antarctic journal of the United States, July-Aug. 1972 7(4), p.108-110, 2 refs.
G845.A56

A third field season in the joint research program of the U.S. National Science Foundation and the U.K. Scott Polar Research Institute (SPRI) was carried out from Nov. 1971 to Jan. 1972. The method and sounding instruments used for ice thickness measurements were obtained over more than 70 percent of the 57,000 km of flight lines, and examination of the records permits some preliminary conclusions to be drawn. A new map of the Ross Ice Shelf recently has been

completed, and completion at SPRI of contour maps of East Antarctica is expected shortly. The maps will show the surface elevation with an accuracy of 50 m and ice thickness to an accuracy of 2 percent.

F-11592
Bucher, P. , Stauffer, B.
BORE HOLE ISOTOPE STUDIES AT BYRD STATION, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1972 7(4), p.110-111
G845.A56

A down-hole technique, developed during a study on the Greenland ice sheet for collecting large amounts of ice from "shallow" bore holes, was used at Byrd Station from Nov. 1971 to Jan. 1972 mainly for sampling unstable isotopes for absolute dating of ice from various depths. The methods used for collecting gas bubbles released by melting ice, and for gas analysis are discussed. During Jan. 1972, four down-hole extractions were done at depths of 380, 270, 180, and 100 m below the actual snow surface. At the 380-m depth, the age of the ice is estimated to be 2,400 to 3,200 years.

F-11593
Whillans, I.M.
ICE-SHEET DYNAMICS NEAR BYRD STATION. Antarctic journal of the United States, July-Aug. 1972 7(4), p.111, 2 refs.
G845.A56

This was the second of a three-season program of studying ice-sheet deformation near Byrd Station from Nov. 15, 1971 to Feb. 12, 1972. The first season's work was described in Dewart and Whillans in 1970 (see F-8392). The survey techniques were almost the same this year, the network size was doubled, and the original network was resurveyed. In addition to the main experiment, firn settling was studied. Drilling rate profiles in the firn for hot-point drills were obtained for possible correlation with density. The surface winds were recorded at three sites about one km apart to determine the part that inversion winds pay in snow distribution.

F-11601
Warburton, J.A.
NATURAL CONCENTRATIONS OF SILVER AND IODINE IN ANTARCTIC ICE. Antarctic journal of the United States, July-Aug. 1972 7(4), p.121-122
G845.A56

An ice core sampling program was conducted along with ice crystal observations and Aitken nuclei concentration studies at Byrd, Siple and Amundsen-Scott Stations from Dec. 7, 1971 to Feb. 1972. The methods and equipment used for core sampling, ice crystal replication, and ice and snow studies are discussed. The concentration of silver in antarctic ice was found to be less than 10 exp -12 M. Preliminary observations show that there are distinct differences in the characteristics of the ice crystal falling at Siple from those at Byrd Station.

F-11615
Kruchinin, IU.A.
GENETIC CLASSIFICATION OF MICRORELIEF FORMS IN ANTARCTIC GLACIERS AND THEIR ROLE IN PHYSIOGRAPHIC SUBDIVISION OF THE CONTINENT. Geneticheskaia klassifikatsiia form mikrorel'efa antarkticheskikh lednikov i ikh rol' v fiziko-geograficheskom raicnirovanii materika.
Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.304, p.104-127, In Russian. 27 refs.
G600.L4

Data on microrelief forms of ice and snow in Antarctica were collected. A scheme of the genetic classification of the microrelief is given. Two types of microrelief (eolian and thermal) are divided into subtypes, which are divided into classes and forms. Seventeen forms, and climatic conditions (wind, solar heat and frost), under which they developed, are discussed. Since snow cover and its microrelief serve as visual indicators of natural conditions in Antarctica, as soil and plant cover do on the other continents, their study should be encouraged.

F-11617
Robin, G. de Q. ed
GLACIOLOGY. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.41, 239p., Bibliography p.189-226
QC801.3.S6

The volume records the progress in the study of glaciology during the IGY (1957-1958) and the IGC (1959). Coverage is world-wide and includes reports on national activities in arctic and antarctic regions as well as alpine areas. Emphasis is placed on the identification, description, physical properties, and morphology of glaciers. Among measurements made by many of the nations are accumulation and ablation, ice thickness, glacial meteorology, and deep ice temperatures. A catalog of IGY-IGC published material held at IGY World Data centers is also included.

F-11627
Wager, A.C.
FLOODING OF THE ICE SHELF IN GEORGE VI SOUND. British Antarctic Survey. Bulletin, June 1972 No.28, p.71-74, 13 refs.
QH84.2.B72

The surface of the ice shelf in George VI Sound between lat. 70 deg 40 min and 71 deg 50 min S. floods annually during January and February. The area of flooding is sharply defined and appears to be due to surface contamination by wind-blown rock debris. This decreases the albedo, causing increased radiation absorption and melting. The debris comes from sedimentary rocks found only on the western side of the sound between limits that correspond to the extent of flooding. The frozen surface of the previous year's floods forms an impervious stratum which together with the low surface slopes of the ice shelf, prevents drainage of melt water. (Auth.)

F-11637
Aver'ianov, V.G.
USE OF NEW GLACIOLOGICAL RESEARCH TECHNIQUES IN ANTARCTICA. Soviet hydrology: selected papers, Nov. 1972 No.6, 1970, p.522-529, For Russian original see 27-3734 or F-9626. 38 refs.

A review of methods used for aerial and surface measurements of glacier thickness and morphology, and snow accumulation by Soviet, American, British, French and Japanese scientists in Antarctica until 1968 is given. The latest procedures and techniques used in glaciological surveys, such as drilling, surface trigonometric leveling, tellurometry, optical rangefinding, rocket shooting, radar sounding and the like, have increased the accuracy in measurements up to

plus or minus one percent, and made possible obtaining new information on phenomena which occur in the ice cover. An international program for glaciological surveys using newest methods at all antarctic stations is considered.

F-11638
Bogorodskii, V.V. , Trepov, G.V., Fedorov, B.A.
POSSIBILITY OF USING LASERS TO INVESTIGATE THE DYNAMICS OF ICE SHEETS. Soviet hydrology: selected papers, 1970(Publ. Nov. 1972) No.6, p.529-531. For Russian original see 26-C759. 1 ref.

Use of a Doppler laser system reduces the measurement time of glacier surface velocity at one point to several seconds. Fifty seconds are needed to measure the velocity of slowly moving glaciers (1.58 m/year) provided 10 signal oscillations are observed at the output of the recording instrument. In principle it is possible to use this method to measure lower ice velocities of about several centimeters. To illustrate application of the system, equations are given relating the reference and reflected signals, which consider emitted oscillations, angular Doppler frequency, change in amplitude of received signals and power at the input of the optical receiver; vector diagrams are given of velocity components at various points on the glacier surface as determined by transponders located at different points on bedrock.

F-11642
Albright, J.C.
ACCUMULATION AND STRAIN RATE DATA, ROOSEVELT ISLAND, ANTARCTICA. University of Wisconsin, 1965. 25p., Unpublished manuscript.

During the 1964-1965 summer snow accumulation on Roosevelt Island, a small ice dome rising out of the Ross Ice Shelf, was measured and strain rate poles were reset to insure location in the future. This work is part of a continuing program to determine the mass budget of the dome by measuring surface accumulation and strain rates. Initial measurements were taken in 1961 and current plans call for complete remeasurement in 1966-1967 or 1967-1968. Accumulation nets, accumulation lines, and strain rate networks on the island are described. Appendices list equipment used and present nine pages of accumulation net, accumulation line, and strain rate network data.

F-11644
Fletcher, J.O. , Donn, W.L., Shaw, D.M., Fritz, S.
ICE ON THE OCEAN AND WORLD CLIMATE. Symposium on Beneficial Modifications of the Marine Environment. March 11, 1968, 11th, Washington, D.C. [Proceedings]. Washington, D.C., National Academy of Sciences, 1972, p.4-65, Includes discussions by W.L. Donn, D.M. Shaw and S. Fritz. 75 refs.

About 10 percent of the ocean area in the Northern Hemisphere is covered by floating ice in winter; in the Southern Hemisphere, over a larger ocean area, the figure is about 13 percent. The extent of this pack ice varies greatly during the year and from year to year. It has long been observed that these variations show a close correlation with many indices of climatic change. As the arctic ice pack recedes, storm tracks tend to go farther north, and midlatitude rainfall patterns tend to shift eastward. This paper attempts to explain why the variable extent of ice on the sea is a very sensitive climatic lever that can amplify the effects of small changes in global heating. The prospect for influencing these processes is also discussed. (Auth.)

F-11748
Paterson, W.S.B.
LAURENTIDE ICE SHEET: ESTIMATED VOLUMES DURING LATE WISCONSIN. Reviews of geophysics and space physics, Nov. 1972 20(4), p.885-917. Numerous refs.
QC801.R46

Estimates are made of the volumes of the Laurentide ice sheet and the Innuitian ice sheet (covering the Canadian Arctic Islands north of latitude 74 N) from 18,000 to 6000 B.P. Relevant parts of the existing theory of flow in an ice sheet are first reviewed. Two limiting models are considered: a steady-state ice sheet, the dimensions of which do not change with time, and stagnant ice sheet that thins at the same rate everywhere. Formulas relating ice thickness to radius and volume to area are given. The relation between area and volume of six existing ice sheets is examined, including Roosevelt I., a grounded part of the Ross ice shelf, the Wilkes ice dome, and the Antarctic ice sheet.

F-11771
IAkovlev, G.N. ed
STUDIES IN ICE PHYSICS AND ICE ENGINEERING. Jerusalem, Israel Program for Scientific Translations, 1973, 192p., TT 72-50005, Translation of Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.300.

This collection of papers indicates some of the results obtained in studies of ice carried out during recent years. A wide range of subjects in many fields of ice research are dealt with: the structure of an ice cover, its elastic characteristics, methods for predicting the strength characteristics of an ice cover, techniques for breaking ice, theoretical and experimental laboratory work, etc. For individual papers see CRREL 27-2055 through 27-2075, or Ant. Bib. F-10437-10439 and J-10440.

F-11772
Fedotov, V.I.
STUDIES OF ANTARCTIC FAST ICE. Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Transactions (Trudy), Vol.300, IAkovlev, G.N., ed., Ice physics and ice engineering, Jerusalem, Israel Program for Scientific Translations, 1973, p.95-104, TT 72-50005, For Russian original see 26-1973 or F-10437. 28 refs.

On the basis of information obtained from the Lena and Ob', on reconnaissance flights, and at coastal stations, the features of Antarctic fast ice and problems in ice studies are discussed. Effects of snow, wind, temperature, and radiation on the formation and structure of fast ice are described. The heterogeneous structure and numerous layers of different origins are the main reasons for the low strength of Antarctic fast ice. Data on the compressive and flexural strength, elasticity, and hardness of fast ice in East Antarctica can be used for navigation purposes. A plan for further studies of the Antarctic fast ice is suggested.

F-11773
Kozlovskii, A.M.
FORMATION AND STRUCTURE OF FAST ICE AT MIRNY

ANCHORAGE AND IN ALASHEEV BIGHT. Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Transactions (Trudy), Vol.300, IAkovlev, G.N., ed., Ice physics and ice engineering, Jerusalem, Israel Program for Scientific Translations, 1973, p.105-111, TT 72-50005, For Russian original see 26-1974 or F-10438. 11 refs.

Data on the structure, salinity, density, and flexural strength of sea ice, as well as snow accumulation and iceberg distribution in Alasheyev Bight in 1967 and in the Davis Sea in 1963 are given. The results show considerable differences in the structure and physical properties of fast ice due to different hydrometeorological regimes observed in each region not during but after the formation of fast ice.

F-11774
Fedotov, V.I.
RADIATION BREAKUP OF ANTARCTIC FAST ICE. Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Transactions (Trudy), Vol.300, IAkovlev, G.N., ed., Ice physics and ice engineering, Jerusalem, Israel Program for Scientific Translations, 1973, p.112-120, TT 72-50005, For Russian original see 26-1975 or F-10439. 24 refs.

Data from previous observations were used to study the effects of solar radiation on the change and destruction of Antarctic fast ice and snow, including the influence of such other factors as radiation balance, solar altitude, air temperature, wind speed, and organic and inorganic impurities. As a result of artificial coal dusting at Molodezhnaya Station, melt water over the fast ice was about 30-40 cm deep in mid-Dec. This relatively warm layer of water (4-5 C) is a factor in the breakup of the underlying ice. Hence the navigable area can be increased in summer by means of coal dusting.

F-11777
Nye, J.F. , Kyte, R.G., Threlfall, D.C.
PROPOSAL FOR MEASURING THE MOVEMENT OF A LARGE ICE SHEET BY OBSERVING RADIO ECHOES. Journal of glaciology, 1972 11(63), p.319-325, In English with French and German summaries. 11 refs.

The proposed method is to use a radio-echo sounder located on the surface of the ice sheet and to record the shape of the pulses returned from the rock bed. If the instrument is moved horizontally, the shape of the returning pulse will change, large differences occurring in horizontal distances of the order of the wavelength of the radiation, say 5 m. The spatial pattern of this variation, being largely determined by the details of the reflecting rock bed, is expected to remain fixed in position while the ice moves. It thus forms a fixed reference against which ice movement can be measured at places far removed from fixed landmarks. Analogue experiments in the laboratory, using ultrasonic waves in air in place of radio waves in ice, suggest that it should be easy to detect a movement of 1/10 wave length, 0.5 m, and, with further refinement, much smaller movements. A field test is in preparation.

F-11800
Brier, F.W. , Paige, R.A.
SNOWDRIFT AND FOUNDATION STUDIES FOR THE NEW SOUTH POLE STATION. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Nov. 1971 N-1249, 35p., AD-753 192, 16 refs.

A two part study was conducted to determine the snowdrift characteristics of the new South Pole Station and properties of snow foundations at the South Pole. Snowdrift characteristics were studied using 1:150 scale models in a wind duct and 1:10 scale models in the field. From the scale model tests, areas of high and low snow accumulation rates were determined for a static undisturbed state in the vicinity of the station. The physical properties of natural and compacted snow were determined for the South Pole and three load settlement tests were conducted on different foundation materials. The load settlement tests showed that the settlement rate of footings on natural snow is several times greater than footings on compacted snow.

F-11802
Shimizu, H. , Naruse, R., Omoto, K., Yoshimura, A.
POSITION OF STATIONS, SURFACE ELEVATION AND THICKNESS OF THE ICE SHEET, AND SNOW TEMPERATURE AT 10 M DEPTH IN THE MIZUHO PLATEAU-WEST ENDERLY LAND AREA, EAST ANTARCTICA, 1969-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.12-37, 2 refs.

Glaciological studies conducted during oversnow traverses by JARE 10 and 11 in the Mizuho-Plateau-West Enderby Land area included the following measurements: 1) astronomic surveys for determining geodetic positions at 17 stations on the routes of the traverses; 2) surface elevation of the ice sheet, measured by means of barometric altimetry; 3) thickness of the ice sheet, measured by radio echo sounding; and 4) snow temperature at 10 m depth, for the purpose of estimating annual mean air temperature. The results of the measurements are given in tabular form.

F-11803
Ageta, Y. , Watanabe, O.
NET ACCUMULATION OF SNOW BY STAKE MEASUREMENTS IN MIZUHO PLATEAU, EAST ANTARCTICA, 1968-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.38-47

Measurements of net accumulation of snow by means of stakes were carried out by the oversnow traverse parties of JARE 9, 10, and 11 during the period Oct. 1968 to Jan. 1971. The data indicate that the net snow accumulation is greater in the coastal region than in the inland area, and that the bulk of the accumulation is deposited during the winter. Considerable differences are noted in the accumulations of 1969 and 1970.

F-11804
Watanabe, O. , Ageta, Y.
SURFACE CONDITION OF THE ICE SHEET IN THE MIZUHO PLATEAU-WEST ENDERBY LAND AREA, EAST ANTARCTICA, 1969-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.48-76, 5 refs.

During the JARE 10 and 11 oversnow traverses the following observations and measurements were carried out: 1) observations of the relief of snow surface at intervals of 2 or 5 km along the route; 2) measurements of surface hardness of the snow cover at the same intervals as above; 3) measurements of vertical profile of ram hardness in the snow cover, from the surface down to the depth of 2 m, using a ram sonde at intervals of 10 km; and 4) measurements of directions and inclinations of surface slopes of the ice sheet at intervals of 10 km, when the skyline of the ice sheet was visible.

F-11805
Miura, Y.
STRATIGRAPHIC OBSERVATION OF THE SURFACE SNOW COVER IN MIZUHO PLATEAU, EAST ANTARCTICA, 1969-1970. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.77-87

Stratigraphic observations were made of 1 to 10 m deep snow cores at 78 stations during the JARE 10 traverse in 1969-1970. Positions of wind crust layers, grain shapes and grain sizes were noted. Vertical distribution of the snow density and Kinosita's hardness of snow were measured also at some of these stations. The snow cores were obtained by means of a hand auger. The station numbers, dates of observations, depths of snow cores or pits, items observed, and names of observers are shown.

F-11806
Watanabe, O.
STRATIGRAPHIC OBSERVATION OF THE SURFACE SNOW COVER IN WEST ENDERBY LAND, EAST ANTARCTICA, 1970-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.88-110

Surface snow cover observations along the traverse route of JARE 11 included stratigraphic observations and measurements of density and grain size on 2 m long cores at 44 stations; measurement of a vertical distribution of ram hardness in the snow cover at these stations from the surface down to a depth of 2 m; detailed stratigraphic profiling and density measurements on 5 m long snow cores at 4 stations and 10 m long snow cores at 11 stations; and measurement of snow temperatures at the surface and 2 m below the surface at 33 stations. The results are given.

F-11807
Naruse, R. , Yoshimura, A., Shimizu, H.
INSTALLATION OF A TRIANGULATION CHAIN AND A TRAVERSE SURVEY LINE ON THE ICE SHEET IN THE MIZUHO PLATEAU-WEST ENDERBY LAND AREA, EAST ANTARCTICA, 1969-1970. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.111-131

For the purpose of conducting research on the ice sheet flow, a triangulation chain and a traverse survey line, 250 and 200 km in total length respectively, were installed in the Mizuho Plateau-West Enderby Land area in 1969 and 1970 by JARE 10 and JARE 11. The triangulation chain, extending from 72 deg 00.1 min S, 43 deg 10 min E to 71 deg 47.5 min S, 36 deg 12 min E, a nunatak at the south end of the Yamato Mts., is composed of 162 triangles and 164 stations. The traverse survey was carried out from a south peak of the Sandercock Nunataks southwestward, covering 55 stations on the ice sheet.

F-11808
Murozumi, M. , Shimizu, H.
CHEMICAL CONSTITUENTS IN THE SURFACE SNOW COVER IN THE MIZUHO PLATEAU-WEST ENDERBY LAND AREA, EAST ANTARCTICA, 1970-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.132-134, 2 refs.

Chemical constituents (Na, K, Mg, Ti, and silicate) in the surface snow of the ice sheet collected at six locations in the Mizuho Plateau-West Enderby Land area in 1970-1971 by JARE 11 were quantitatively analyzed by the method of isotope dilution mass-spectrometry and atomic absorption. The results obtained up to date are reported. Six samples composed of a whole year's precipitation showed an extremely low concentration of chemical constituents similar to the composition of sea salt. The surface snow cover of this area appears to be homogeneous in chemical properties, while snow samples collected along the Showa-South Pole traverse route show some heterogeneity.

F-11955
Orheim, O.
200-YEAR RECORD OF GLACIER MASS BALANCE AT DECEPTION ISLAND, SOUTHWEST ATLANTIC OCEAN, AND ITS BEARING ON MODELS OF GLOBAL CLIMATIC CHANGE. Ohio. State University, Columbus. Institute of Polar Studies. Report, Sept. 1972 No.42, 118p., Numerous refs.

Annual net mass balance variations from about A.D. 1780 to the present were determined from ice stratigraphy in the fissures and craters revealed by the subglacial volcanic eruptions on Deception I. in 1969 and 1970. Meteorological data indicated a significant negative correlation between summer degree-days on the island and stratigraphically determined net balances. Close correlation was also noted between summer degree-days and summer balances. Stratigraphic studies revealed 23 probable volcanic eruptions since 1780. The summer temperature variations at Deception I. are representative of regional variations in the southwest Atlantic Ocean. Comparisons between the data from the northern and southern hemispheres indicate that models proposed to explain climatic changes must account for a global warming from late last century to about 1940, and an antiphase cyclic relationship, characterized by dominant periods of about 11 and about 20 years, in the climatic elements that affect glacier mass balances in middle to high latitudes in both hemispheres.

F-11941
Barkov, N.I.
PRELIMINARY RESULTS OF ICE DRILLING AT VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.58-60, Translated from its Informatsionnyi biulleten', No.80, 1970. 3 refs.

Drilling into the ice sheet at Vostok Station has been under way since April, 1970 with an electrothermal drill. The transformation of snow into firn and then ice is analyzed down to 325 m. A cold type of metamorphic ice formation is typical, following the path of sublimational recrystallization, viscous increase in density, and recrystallization. Mineral content of the core remained constant. No orderly orientation of optical crystal axes was noted. Crystal size increased slowly with depth, avering 1.15 mm at 100 m and 2.29 mm at 300 m. The shape was generally subangular without distinct elongation. Air bubbles are rounded and evenly distributed. By the end of August, 1970, the borehole had reached 503 m and drilling was continuing.

F-11946
Zakharov, V.F.
FORMATION OF A WATER INTERLAYER IN THE ICE OF EPISHELF LAKE-LAGOONS IN THE SCHIRMACHER PONDS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.72-73, Translated from its Informatsionnyi biulleten', No.80, 1970. 1 ref.

The formation of an interlayer of water at a depth of 120-120 cm is discussed. As an explanation of the phenomenon it is suggested that impurities (dust, sand, mineral particles) accumulating on the ice accumulate heat, promote melting, and sink into the ice. By autumn the

layer of impurities has stabilized at, presumably, the depth of the water interlayer, which it forms by collecting heat during the summer. This theory agrees with the current explanation for the formation of cryoconite holes: depressions on the surfaces of glaciers as a result of cryoconite accumulation.

F-11947
Chikovskii, S.S. , Kornilov, N.A.
STRENGTH OF SEA ICE IN ALASHEYEV BIGHT IN 1968. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.73-75. Translated from its Informatsionnyi biulleten', No.80, 1970.

Fast ice was subjected to stress tests with a PIM-100 press to determine the flexural strength. Variations during the year as a result of meteorological conditions are graphed. Littoral fast ice, free of winter snow because of strong drainage winds, underwent accelerated growth since the wind promoted heat outflow, strengthening the middle and lower ice layers until solar radiation begins to weaken it in the spring. The strength of the upper layer decreases in late June and early July, increases in August, and decreases again during late October. But in December and January strength of the upper layer rises again to as much as 17 kg/sq cm because of melting during the day and nighttime recrystallization under the effect of drainage winds. A water interlayer is generally formed with a salinity between that of the sea water and the ice. The strength of the entire ice cover drops sharply in November.

F-11964
Shimizu, H. , Watanabe, O., Yoshimura, A.
GENERAL REPORT OF THE GLACIOLOGICAL RESEARCH WORK OF THE 11TH JAPANESE ANTARCTIC RESEARTH EXPEDITION, 1970-1971. Antarctic record, Nov. 1972 No.45, p.12-19, 5 refs.

The glaciological research carried out by JARE 11 in 1970-71 consisted of the following: 1) routine glaciological work at East- and West-Ongul Is; 2) observations of the ice sheet along the Soya Coast and of icebergs in Lutzow-Holm Bay; 3) observations of glacier movement and coastal ice sheet movement during the summer season in the Langhovde area; 4) winter travel inland to establish the Mizuho Camp; and 5) a summer oversnow traverse to complete basic observations and surveys started during the first observational period of the program.

F-11965
Watanabe, O. , Yoshimura, A.
GLACIOLOGICAL OBSERVATIONS IN THE VICINITY OF MIZUHO CAMP, ENDERBY LAND, EAST ANTARCTICA, 1970. Antarctic record, Nov. 1972 No.45, p.20-32, In Japanese with English summary. 3 refs.

The Mizuho Camp, located at lat. 70 deg 42.1 min S and long. 44 deg 17.5 min E, about 300 km southeast of Showa Station, was established by JARE 11 in the winter of 1970 as an observatory of scientific research. During the 22 days trip the party made glaciological observations of the winter surface of inland ice. After the trip the observatory hut was constructed to install the instruments for long-term meteorological observations. A four-meter deep snow pit was dug for snow surface stratigraphic studies to a depth of 20 m. Observations carried out in the vicinity of the Mizuho Camp included: 1) survey of ice sheet topography near the Mizuho Camp and observations of surface reliefs; 2) observations of the occurrence of glazed surface and its distribution; and 3) observations of surface snow cover in the wall of the 4 m deep snow pit with the boring core from 4 m down to 20 m and measurements of the snow temperature from the surface down to the depth of 10 m. Mean air temperature estimated from the snow temperature at the depth of 10 m is -32.2 C. Annual snow accumulations are in the range from 140 mm to 150 mm in water.

F-11966
Naruse, R. , Endo, Y., Narita, H., Yamada, T.
STRATIGRAPHIC ANALYSIS OF A 10 METER DEEP FIRN CORE FROM THE INLAND AREA NEAR SYOWA STATION, EAST ANTARCTICA. Antarctic record, Nov. 1972 No.45, p.33-46, 13 refs.

This paper presents methods and results of a stratigraphic analysis of a 10 m deep firn core which was collected from the inland area near Showa Station, East Antarctica, by the 10th Japanese Antarctic Research Expedition (JARE) in 1969 and was subjected to study at the laboratory of Hokkaido University in 1970. The analysis includes observations on stratigraphic features, density, hardness, and grain size. Also included in the analysis are detailed observations on snow texture, density, and specific surface by means of enlarged photographs of cross sections of the firn core from the surface down to the depth of 1 m.

F-11991
Luchininov, V.S. , Rudakov, V.N.
RADIOINTROSCOPY OF GLACIERS. Radiointroskopiia lednikov. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1970 Vol.17, p.51-59, In Russian with English summary on p.167. 24 refs.

Mathematical models for analyzing interactions between electromagnetic fields and glaciers are discussed. The increasing accuracy of the original model as it was developed, with the consideration of new factors such as snow cover, ice crystal structure, and firn, is described. The model includes calculation of the heterogeneity of refraction indices, changes in the coefficient of attenuation according to depth, infrared absorption, coefficient of reflection from the glacial surface, and the amount of anisotropy.

F-11992
Kogan, A.L.
RESULTS OF SEISMIC SOUNDING ALONG THE PROFILE MOLODEZHNAYA - POLE OF RELATIVE INACCESSIBILITY. Rezul'taty seismicheskogo zondirovaniia na profile Molodezhnaia - Polius otnositel'noi nedostupnosti. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1970 Vol.17, p.75-78, In Russian with English summary on p.168. 3 refs.

The results of seismic and magnetic soundings along the Molodezhnaya Station - Pole of Relative Inaccessibility profile in 1967 are given. Thickness of the ice sheet according to seismic soundings is tabulated. It is postulated that the "criti cal thickness" of the ice sheet is 2200 and that this thickness is reached 800 km from the shoreline. The nature of various layers of the ice sheet and of the underlying topography are described.

F-11993
Loseva, I.A.
COMPARATIVE EVALUATION OF THE METHODS USED IN CENTRAL ANTARCTICA FOR MEASURING ACCUMULATION. Sravnitel'naia otsenka rezul'tatov izmerenii akkumuliatsii v tsentral'noi Antarktide. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1970 Vol.17, p.208-216, In Russian with English summary. 24 refs.

On the basis of published Soviet and foreign data, the following major methods for measuring snow accumulation in Antarctica are briefly discussed: stake, stratigraphic, isotopic (O-18/O-16 ratio), artificial radioactive, and Pb-210. The comparison of results shows that the stratigraphic method giving the most extensive information is unfit for the Central Antarctic without a main stake network. Error in determining mean annual accumulation may be as great as 300 percent. The O-18/O-16 ratio methods remains insufficiently developed and generally gives overestimated results. Reliable accumulation data may be obtained as a result of long period stake observations (using a stake network or along profiles) as well as by measuring by marked layers. Geochemical, radioactive, and Pb-210 methods also provide objective estimates of annual accumulation which correlate with data obtained from the stake method. The state of knowledge of snow accumulation on the mainland requires mass measurement by determining the level of the 1955 and 1964 artificial radioactive horizons. It is advisable to mark the snow surface with dye or synthetic film. (Auth.)

F-11994
Vinogradov, G.N.
SNOW ACCUMULATION ALONG THE MIRNYY - VOSTOK STATION PROFILE AS OBSERVED IN 1964 AND 1969. Nakoplenie snega na profile Mirnyi - stantsiia Vostok (po rezul'tatam nabliudenii 1964 i 1969 gg., Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1970 Vol.17, p.216-222, In Russian with English summary. 19 refs.

The results of snow accumulation rate observations along the Mirnyy - Vostok station profile carried out by determining the deposited snow layer depth and its density from markers and with a standard meteorological densitometer are given. The measurements were performed twice in 1964 and 1969 in four areas covering parts of the profile over an 800 km. distance in inner continental regions. Data for Vostok Station correlate well with those of other sources including isotope investigations of the upper part of the cover thickness. The data demonstrate a regular rise in the snow accumulation rate towards peripheral regions of the ice sheet from 2.5 gr/sq cm/year at Vostok to 10 gr/sq cm/year at a point 130 km south of Pionerskaya Station. A considerable difference in values of deposited snow layer depth in a limited area and its more constant density are noted. The data enable values of snow accumulation to be made more accurate for an extensive area between Vostok and Pionerskaya. In conclusion recommendations are given on effective organization of snow measurement including the combination of the linear route and snowpoint methods. (Auth.)

F-11995
Vinogradov, G.N. , Garelik, I.S.
LONG-DISTANCE RADIOMETRY TECHNIQUES USED IN ANTARCTICA IN THE JOINT SOVIET-FRENCH INVESTIGATIONS CONDUCTED IN 1963-64 AND 1968-69. Radiodal'nomernye izmereniia v gliatsiologicheskikh issledovaniiakh Antarktidy (opyt sovmestnykh Sovetsko-Frantsuzskikh rabot v 1963-64 i 1968-69 gg.. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1970 Vol.17, p.316-328, In Russian with English summary. 5 refs.

Radiogeodesic measurement methods employed during Soviet-French studies in 1963-1964 and 1968-1969 are outlined. The goal of the studies was to obtain quantitative characteristics of present glaciological processes in inner continental regions of the high plateau in East Antarctica, an area to which access is extremely difficult. Being highly accurate, radiogeodesic measurements have made it possible to obtain the deformation rate of the surface layer of a glacial cover in several regions of the continent (at a distance of 490-1330 km from the coast). Remote radio equipment (tellurimeters), the mounting of equipment on heavy tractors, and field and lab calculation methods are given. Sources of measurement errors, data on theoretical and practical accuracy, and the expenditure of time are discussed. Ice cover deformation rates, increasing from the center to the edge of the continent, are interpreted. The results attest to the reliability of remote radio measurement in glaciological studies, as proposed by P.A. Shumskii and A. Bauer. (Auth. mod.)

F-11999
Sissala, J.E. , Sabatini, R.R., Ackermann, H.J.
NIMBUS SATELLITE DATA FOR POLAR ICE SURVEY. Polar record, Sept. 1972 16(102), p.367-373, 18 refs.
G575.P6

Polar-orbiting meteorological satellites have been used to monitor the distribution, variability, and behavior of sea ice in both Arctic and Antarctic regions. The Nimbus orbit affords daily coverage of remote polar areas that are not routinely viewed by aircraft reconnaissance, and observations made by Nimbus satellites have proved the feasibility of an operational satellite polar ice monitoring system. Information from Nimbus satellites has greatly added to knowledge of the ice climatology of polar oceans and provides valuable guidance for polar shipping.

F-12011
Weeks, W.F. , Campbell, W.J.
ICEBERGS AS A FRESH WATER SOURCE: AN APPRAISAL. U.S. Army Cold Regions Research and Engineering Laboratory, RR 200, January 1973, 29p., AD-755 815, 37 refs.

A history of the idea of transporting large icebergs to arid regions to provide a fresh water source is presented and the problem is considered in four main parts: 1) Location of a supply of icebergs. 2) Towing. 3). Melting in transit. 4)Economic feasibility. The problems related to both iceberg transport and processing are reviewed and although substantial problems do exist, they appear to be within the capabilities of current technology. It is suggested that the overall idea is indeed feasibile and should be explored further by specific groups of experts. (Author mod.)

F-12016
Koptev, A.P.
SOME RESULTS OF INVESTIGATIONS OF THE THERMAL DIFFUSIVITY OF ICE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.128-131, Translated from its Informatsionnyi biulleten', No.81, 1970. 4 refs.

The thermal characteristics of ice were

determined ay Mirnyy during Sept.-Nov. 1969 by the regular thermal regime method. Both land and sea ice samples were taken fromm boreholes to a depth of 250 m. Computed heating rates and thermal diffusivity and conductivity coefficients of land ice from two areas and one-year-old sea ice from various depths are tabulated and the mathematical methodology is described. The smaller the temperature difference and the form factor, the faster the regular regime was found to set in and the greater was the rate of heating. Salinity and density variations with depth caused variations in sea ice thermal diffusivity. Observational data correlated well with that from the drifting station North Pole-5.

F-12026
Klokov, V.D.
MAGNITUDE OF MELTWATER RUNOFF. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.154-157, Translated from its Informatsionnyi biulleten', No.81, 1970. 6 refs.

Ice-surface streams formed by meltwater in the Molodezhnaya Station area are studied and a possible working method of estimating meltwater runoff magnitude is developed. Basic data on the six major ice-surface streams of the area is tabulated. Ice-surface watercourses in the coastal zone are of decided interest as indicators of liquid runoff, which, according to preliminary computations, reaches hundreds of thousands of cubic meters per meter of coastline.

F-12027
Orlov, A.I.
SOME RESULTS OF LIMNOLOGICAL INVESTIGATIONS ON FILDES PENINSULA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.158-160, Translated from its Informatsionnyi biulleten', No.81, 1970.

Limnolcgical investigaticns cn Fildes Peninsula, King George Island, were undertaken in meltwater-fed lakes. Water temperature according to depth, metecrological situation of the area, seasonal nature of lake drainage, and ice formation on the lake surfaces are discussed and data is included.

F-12029
Nikolaev, S.E.
EFFECT OF HYDROMETEOROLOGICAL CONDITIONS ON THE STRENGTH OF THE FAST ICE IN ALASHEYEV BIGHT IN 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.162-163, Translated from its Informatsionnyi biulleten', No.81, 1970. 2 refs.

The structure and strength of ice in the Alasheyev Bight varies markedly according to snow cover, wind strength, and other conditions under which the ice was formed. The ice is weakest in those areas of fast ice where ice formation was accompanied by snow drifting. Upper layers of ice are strongest during June-July and the lowest layers during Aug.-Sept. Because of radiational warming, the strength of upper layers decreases in Oct. By the end of Nov. ice porosity increases due to warming and internal melting, and the ice becomes saturated with meltwater and brine. Despite this, in Dec. 1969, Alasheyev Bight ice was still strong enough for cargo transportation up to 50 metric tons. Conditions of ice formation affect crystalline structure. If snow cover over growing ice is thick and the initial ice crust has slightly melted resulting in water-snow ice formation, a disordered fine-grained structure with isometric crystals of irregular shape will predominate. In the absence of such conditions, the ice will generally be columnar-fibrous with vertical development in the form of irregular columns in the Bight.

F-12030
Nikolaev, S.E.
BLASTING FAST ICE IN THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.164-166, Translated from its Informatsionnyi biulleten', No.81, 1970. 3 refs.

Blasting experiments were performed on the fast ice of Alasheyev Bight in August 1969 to determine the most effective charge weight for breaking ice 105-110 cm thick; to establish the optimum charge placement depth under the ice, the zone of total ice destruction and the zone of crack formation; and to find ways of improving blasting efficiency. It is suggested that the main criterion of ice blasting effect should be the area of crack formation. Explosion of paired charges were found to increase the total ice destruction area by about 20 percent, though the area of cracked ice remains the same. Directed charges must be used to produce a lead. To clear a channel in fast ice paried charges should be used. To cut a 1 km channel 18 m wide in 1.0 to 1.2 m thick ice requires 2500 kg of explosives. Data is tabulated for ice 1.1 m thick using single concentrated charges in Antarctic and other ice and paired charges in Antarctic ice at various depths.

F-12053
Schaefer, T.G.
RADIO ECHO SOUNDING IN WESTERN DRONNING MAUD LAND, 1971 -- A PREVIEW. South African journal of antarctic research, 1972 No.2, p.53-56, 4 refs.

Preliminary results are presented of the South African Antarctic Research Expedition's radio echo sounding program. Profiles of subglacial topography were recorded over a distance of 630 km, mostly in the Ahlmannryggen and along its boundaries. South of SANAE on the ice-shelf strong continuous echoes were recorded, the depth ranging from 300 m at SANAE to approximately 700 m in the Draaipunt area. Comparison is made between ice depth measurements obtained by radio echo sounding in the area and those obtained by gravimetric and seismic methods.

F-12068
Lambert, G. , Lorius, C., Ardouin, B., Brichet, E.
CONTRIBUTION TO THE STUDY OF SR-90 FALLOUT IN ANTARCTICA. Symposium on Hydrogeochemistry and Biogeochemistry, Tokyo, 1970. Proceedings. Vol.I: Hydrogeochemistry, Washington, D.C., Clarke Company, 1973, p.647-651, 6 refs.

Additional measurements of the deposition of Sr-90 on firn in Antarctica are presented in graphic form as supplements to earlier measurements. The new data relate mean specific activity and deposition of Sr-90 to snow accumulation during the period 1955-1963. The new data combined with earlier measurements affords the opportunity to make a preliminary construction of iso-lines of deposition for most of the continent, recognizing that the accuracy of the iso-lines is considerably reduced by the scarcity of measurements.

F-12070
Fujiwara, K. , Torii, T., Murozumi, M.
PRELIMINARY INVESTIGATION OF CHEMICAL

CONSTITUENTS IN POLAR SNOWS. Symposium on Hydrogeochemistry and Biogeochemistry, Tokyo, 1970. Proceedings. Vol.I: Hydrogeochemistry. Washington, D.C., Clarke Company, 1973, p.661-682

Chemical constituents in snow samples taken at 2 meters depth from the surface of ice strata between Showa and Plateau Stations, and between Showa Station and the South Pole by the 8th and 9th J.P.R.A. traverse teams have been analyzed by the atomic-absorption method and isotope-dilution mass spectrometry. The former method, using the Nippon Jarrell-Ash Model AA-I meter, was applied to brines obtained by successive freezing of snow melts. The Hitachi RMU-6 mass spectrometer, which has a specially devised ion source, made it possible to determine 10 exp -8g of potassium with sensitivity of 10 exp -14g with a relative error of one percent. The results are listed. Concentrations of sodium, potassium, and magnesium have been found to be at the ppb level in weight.

F-12188
Thomas, R.H.
CREEP OF ICE SHELVES: THEORY. Journal of glaciology, 1973 12(64), p.45-53, In English with French and German summaries. 12 refs.

Budd's expressions for strain-rate gradient along the centre line of a bounded ice shelf are shown to be applicable only to ice shelves with almost constant thickness and very small longitudinal strainrates. A general expression is derived from creep in an ice shelf where the sole restriction is that of zero shear stresses in vertical planes. This is applied to the two special cases: (1) movement of an ice shelf restricted in at least one direction by sea-water pressure only; (2) movement of an ice shelf flowing between roughly parallel sides. (Auth.)

F-12189
Thomas, R.H.
CREEP OF ICE SHELVES: INTERPRETATION OF OBSERVED BEHAVIOUR. Journal of glaciology, 1973 12(64), p.55-70, In English with French and German summaries. 19 refs.

Available measurements of creep rates and dimensions of ice shelves are used, in conjunction with equations derived in a companion paper (Thomas, 1973), to evaluate the flow law parameters B and n for stresses down to 10,000 N/sq m. The results show good agreement with laboratory work at higher stresses. Adoption of these values of B and n enables us to examine the restraining effects of an ice shelf of obstructions such as areas of grounding. (Auth.)

F-12190
Kohnen, H. , Bentley, C.R.
SEISMIC REFRACTION AND REFLECTION MEASUREMENTS AT "BYRD" STATION, ANTARCTICA. Journal of glaciology, 1973 12(64), p.101-111, In English with French and German summaries. 14 refs.

Seismic refraction and reflection shooting was carried out along three profiles about 10 km long, angles 60 deg to one another, near Byrd Station during the 1970-71 field season. No dependence of velocity upon azimuth was found, but velocities at 200 or 300 m depth were slightly greater than at a site 30 km away where measurements were made in 1958. The difference can probably be attributed to different ice fabrics arising from a 50 percent difference in snow accumulation rates at the two sites. The velocity-depth and density-velocity functions at the two sites are also significantly different, but close agreement was found at each site between the depths to significant changes in the velocity gradient and the depths of fundamental change in the densification process. Such agreement may permit density-depth curves, and consequently accumulation rates, to be measured by seismic refraction shooting alone. The reflection shooting on a common reflection-point profile led to a good determination of mean velocity through the ice as a function of angle of incidence. The results agree closely with similar measurements at the 1958 site, and with an anisotropic model based on glaciological and sonic logging observations in the deep drill hole. The mean vertical velocity of 3.90-3.93 km/s through the solid ice is about 2 percent higher than has commonly been used for determinations of ice thickness from seismic reflection shooting. (Auth.)

F-12191
Morgan, P.J.
PHOTOGRAMMETRIC SURVEY OF HOSEASON GLACIER, KEMP COAST, ANTARCTICA. Journal of glaciology, 1973 12(64), p.113-120, In English with French and German summaries. 9 refs.

A study of Hoseason Glacier was made to test whether photogrammetry could yield meaningful glaciological information from repeated series of air photographs without ground control. Three maps indicate that large time differences, different camera systems, and the use of sea ice as a level datum do not present insurmountable difficulties in photogrammetric reduction. Surface horizontal movement was determined and level profiles were compiled. Hoseason Glacier is probably in equilibrium. (Auth.)

F-12192
Clough, J.W.
RADIO ECHO SOUNDING: BRINE PERCOLATION LAYER. Journal of glaciology, 1973 12(64), p.141-143, In English with French and German summaries. 3 refs.

An abrupt change in radio echo sounding travel time was observed on the ice shelf near McMurdo station, Antarctica, and was mapped by a zig-zag traverse. This boundary corresponds to the horizontal extent of brine penetration into the edge of the ice shelf. (Auth.)

--12193
Lange, G.R.
DEEP ROTARY CORE DRILLING IN ICE. U.S. Army Cold Regions Research and Engineering Laboratory, TR 94, Feb. 1973, 47p., AD-758 156, 28 refs.

Rotary drilling equipment was modified and used to obtain cores from glaciers in Northwest Greenland, Byrd Station and Little America V, Antarctica. Using cold compressed air, specially designed bits and other modifications, cores were obtained to 1345 feet in Greenland, 1000 feet at Byrd Station and the Ross Ice Shelf was penetrated to a depth of 840 feet at Little America V. In all locations cracks in the core appeared with increasing frequency at depth due to the sudden release of the overburden load when the core was cut in the air-filled hole. Special equipment and techniques developed dealt with the problem with some success. It is suggested that better cores and greater depths may be obtained by using diesel fuel as the circulating medium. A wireline system instead of drill pipe is suggested for coring to 10,000 foot depths in polar glaciers.

See also:
A-10040,A-10141,A-10167,A-11961,
A-11998,B-10610,B-11473,B-11572,B-11643,
B-11703,B-11987,B-12210,B-12229,C-10220,
C-11291,C-11340,C-11734,D-10007,D-10796,
D-11092,D-11676,D-11801,E-10112,E-10142,
E-10205,E-10324,E-10325,E-10326,E-10327,
E-10328,E-10395,E-10579,E-10894,E-11614,
E-11620,E-11663,E-11789,E-11822,E-11935,
E-11967,E-11969,E-12117,G-10145,G-10526,
G-10893,G-10901,G-10902,G-10915,G-11056,
G-11259,G-11339,G-11438,G-11613,G-11886,
G-11948,G-12196,I-10084,I-10163,I-10542,
I-10725,I-10738,I-10857,I-10868,I-11020,
I-11089,I-11330,I-11456,I-11600,I-11690,
I-12015,I-12017,I-12038,J-10387,J-10392,
J-10393,J-10468,J-10774,J-10777,J-10778,
J-10781,J-10917,J-10942,J-11265,J-11270,
J-11496,J-11775,J-11865,J-11908,J-11973,
J-12131,J-12239,K-10193,K-10743,K-11685,
K-11686,L-10554,L-10970,L-11341,L-11892

G-10116
Hall, A.G.
R.R.S. BRANSFIELD -- A PURPOSE BUILT ANTARCTIC RESEARCH VESSEL. Marine engineers review, March 1971, p.21-2-
VM1.M32
The Royal Research ship Bransfield ordered by the Crown Agents on behalf of the Natural Environment Research Council is a purpose built vessel constructed at the Leith yard of Robb Caledon Shipbuilders Ltd. Bransfield will be operated by the British Antarctic Survey in conjunction with their existing vessel R.R.S. John Biscoe for the annual relief and replenishment of the seven Antarctic bases at present maintained in the British sector. The vessel is strongly built to withstand the stresses imposed by operating conditions in the Antarctic and travels at a service speed of 14 knots. Unlike most conventional ice breakers, Bransfield has a relatively high cargo capacity in addition to accommodation for 36 crew members and 60 expedition personnel. The design, construction, machinery, control room, heating and ventilation, fire protection, and operating conditions are described.

G-10086
Law, P.G.
DEVELOPMENT OF TECHNIQUES OF LOGISTIC SUPPORT FOR EXPEDITIONARY ACTIVITIES. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.145-155+16 plates
QC801.3.S6
Logistically, the IGY was a period of transition, marking the end of the private expedition and the emergence of the government-organized expedition as the only practicable means of providing for continuous, long-term scientific activity. Developments during this period are described in transportation, living, maintenance, and working facilities, fuel handling, power generation, radio communications, food, and clothing. Outstanding logistic advances of the IGY were the establishment by the U.S. of a regular cargo and passenger air service from Christchurch, New Zealand, to McMurdo, a great increase in the number of bases being maintained in Antarctica, and improvement in the general design of stations and services. Possibly the greatest improvement in Antarctic technology was in the field of radio communications.

G-10087
Sheffield, A.H.
COMMUNICATIONS NETWORK IN THE ANTARCTIC. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p. 156-168
QC801.3.S6
Developments in Antarctic radio communication during the IGY included establishment of a Radio Communications Working Group, consisting of representatives of all participating nations, to coordinate communications services; organization of a "mother-daughter" network to facilitate the exchange of metecrological data and to channel it to the Antarctic Weather Central at "Little America"; and allocation of frequencies, coordination of transmission schedules, and assignment of call signs for the many stations. Measures were also taken to assist distress traffic, broadcasting time signals, and eliminate the causes of electrical interference. The design and operation of the communications network are discussed. The Radio Communication Manual was revised up to Aug. 1957 and dispatched to the bases at the beginning of the 1957-58 Antarctic summer.

G-10097
Johnson, G.W. , Clapp, J.L.
RELIABILITY OF REFRACTION IN POLAR ASTRONAVIGATION. American Society of Civil Engineers. Surveying and Mapping Division. Journal, Nov. 1971 97(SU2), p.165-171, 8 refs.
TA501.A655
The use of radiosonde data offers the possibility of overcoming restrictions imposed by the polar environment and of establishing the reliability of existing refraction tables for use in the Arctic and Antarctic. Analysis of limited radiosonde data from the Arctic indicates that with the exception of extremely large zenith angles there exists a high degree of correlation between the actual refraction and refraction values obtained from radiosonde data. Navigators and surveyors operating in the polar regions are often forced to rely on solar observations for their position determinations. The inherently large zenith angles and the resulting large refraction corrections associated with such observations have led many people to question the reliability of positions determined by such means. Reduction of radiosonde data from Thule Air Base, Greenland for a 7-week summer period shows a high degree of reliability for the refraction corrections. (Auth.)

G-10145
Warnke, D.A. , Richter, J.
SEDIMENTARY PETROGRAPHY OF TILL FROM A FLOATING ICEBERG IN ARTHUR HARBOR, ANTARCTIC PENINSULA. Revue de geographie physique et de geologie dynamique, Nov.-Dec. 1970 12(5), p.441-448, 26 refs.
G1.R44, DGS, G(54C) R3
Glacial-marine sediments surround the Antarctic continent in a wide halo, yet only rarely is an Antarctic iceberg encountered which carries debris. A sample of such debris from a bergy bit, floating in Arthur Harbor, at Palmer Station, Antarctic Peninsula was analyzed by standard procedures, and the results are presented. Textural analysis shows that the sediment sample is approximately defined as very poorly sorted, negative-skewed, gravelly mud.

Although running water may have played a prominent part in the accumulation of this sediment, it is texturally characterized as till. The very-fine sand fraction of the sediment consists of plagioclase, quartz potassium feldspar, epidote, amphibole, and minor constituents. This mineralogical composition points to a local derivation of this material. Clay-sized materials, as revealed by X-ray analysis of the <2 micron fraction, consist mainly of "illite" (lepidomelane) and chlorite. No minerals are present which do not also occur in the surrounding outcrops, suggesting negligible, if any, chemical weathering. Quartz is not present in the <2 micron size range, perhaps because comminution of quartz by the glaciers involved does not proceed to this size range. (Auth. mod.)

G-10166
Matveichuk, G.I.
ANTARCTIC DIARY. Antarkticheskii dnevnik. Meteorologiia i gidrologiia, Oct. 1971 No.10, p.122-124, In Russian.
QC851.M27

Location, construction and equipment of the new Molodezhnaya Meteorological Center (formerly Molodezhnaya Station) are reviewed. In March 1971 the Soviet Antarctic meteorological headquarters was transferred from Mirnyy to Molodezhnaya Station. Duties and criteria for stations able to obtain data, analyze them and carry out other meteorological services, are outlined. The following stations met all requirements laid down by the WMO in 1969 for Antarctic conditions: Presidente Frei, Mawson, McMurdo, Mirnyy or Molodezhnaya, and Orcadas.

G-10231
Hosoya, M. , Tsuchiya, K., Yamamoto, R.
REPORT ON THE OPERATION OF MECHANICAL TRANSPORT FOR THE JARE SOUTH POLE TRAVERSE 1968-69. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.204-261

A detailed description is given of the KD60 series of the personnel carrier type and cargo type, sledges, fuel oil, lubricating oil, and relevant matters. The JARE South Pole Traverse 1968-69 covering 5182 km had difficult driving over soft snow and skavler-covered terrain while pulling heavy sledges and crossing over the continental plateau of 3800 m at a temperature of -606 C. The basic problems and associated tasks involving the balancing among snow vehicles, sledges, fuel cargo, and other logistical requirements are discussed and some measures to realize more comfortable traverses are indicated.

G-10232
Nishibe, N.
RADIO COMMUNICATION OPERATED BY THE JARE SOUTH POLE TRAVERSE 1968-69. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.262-263

The JARE South Pole Traverse 1968-69 operated at frequencies between 4 and 28 MHz for radio communication with Showa Station, Amundsen-Scott Station, Plateau Station, McMurdo Station, and Byrd Station, New Zealand Scott Base, British Halley Bay Station, and a number of amateur radio stations. Two KWM-2A transceiver sets were used - 75 and 100 W capacity and source voltage of 28 V DC. Transmission difficulities, receivers, antenna, and schematic diagrams are given.

G-10233
Kawasaki, I. , Kobayashi, A.
EQUIPMENT AND PROVISIONS FOR THE JARE SOUTH POLE TRAVERSE 1968-69. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.264-272

Antarctic clothing and personal equipment were developed and manufactured for this traverse, to conform to changes in the mode of travel: on foot, by dog sledge, snow vehicle KC20 series, and KD60 series. Synthetic fibers, artificial leather, synthetic fibers for filling, and synthetic rubber took the place of natural fibers, fur, down, wool and rubber to a great extent, and were used also in lining and quilting. These new materials proved to be highly satisfactory. The balance of simple and luxury foods used was satisfactory with the exception of providing powdered fruit juices. The only special desire expressed was for beer. A list of the rations is given.

G-10349
Wenzke, N.C.
SHIP OPERATIONS IN THE U.S. ANTARCTIC PROGRAM. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 232-234

Ship operations in the U.S. Antarctic program include resupply of stations by ships of the Military Sealift Command, Coast Guard icebreaker support of these ships and of scientific programs, station refueling by icebreakers, transportation of passengers, and occasional support of an inspection of foreign stations as permitted under the Antarctic Treaty. The most vital of these functions is the annual resupply of the stations. Early Deep Freeze resupply efforts required 3 large cargo ships, 1 or 2 small tankers, and 3 or 4 icebreakers each year. These efforts were further complicated by the wide geographic area of operations and inadequate fuel storage capacity at McMurdo Station. In Deep Freeze 70, the combination of enlarged fuel capacity (8.6 million gal) and the use of a T-5 tanker with an 8-million-gal capacity enabled delivery of a year's supply of fuel in one trip. Further, the 2 dry cargo ships and the tanker could be scheduled to arrive at McMurdo Station 6 wk earlier than before, and only 2 icebreakers were required. This procedure, used successfully during Deep Freeze 70 and 71, has reduced operating costs and increased availability of icebreakers for direct scientific support. Task Force 43 ship operations during Deep Freeze 71 are summarized in order to clarify the relationship of resupply to other activities.

G-10526
Brown, K.
SURVEY STATION MOVES TO STAY STILL. Engineering,

Nov. 22, 1970 210(5454), p.958
TA1.E55
As the south polar ice cap moves steadily northwards at the rate of about 260 ft per year, the Amundsen-Scott Station built in 1956 is nearly a mile out of position. Because of this, and because of damage caused by the crushing effect of the accumulated ice and snow, a new station has been shipped out to Antarctica in sections and it is due to come into operation in 1972. The station will be of an entirely new design by the US Naval Facilities Engineering Command. It is intended to last for ten years and, to keep it as close as possible to the true geographic position of the South Pole over the period, it will actually be erected half a mile away. The station's dominant feature is a geodesic steel dome 50 ft high and 167 ft in diameter that will totally enclose a group of important buildings: the science block and living quarters; galley, post office and meeting hall; the communications center, ship's store and library. A tunnel-shaped passageway from the dome leads to a biological center, garage, fuel store, generator, electrical shop, a 52 ft high tower with a sky laboratory, and an inflation shed for weather balloons incorporating a helium store.

G-10553
Korotkevich, E.S.
OUTPOST OF SOVIET SCIENCE IN THE FAR SOUTH. Forposty sovetskoi nauki na krainem IUge. Chelovek i stikhiia, 1967, p.64-65, In Russian.
QC851.C39
The establishment of Soviet research stations in the Antarctic is briefly described. Eleven Soviet stations built in 12 yrs since 1956 have about 150 scientists the year round to carry out studies on cosmic rays, ionospheric phenomena, auroras, radio waves, geomagnetism, seismology; relief, structure, dynamics, and temperature of glaciers; dynamics, chemistry, and thermal properties of surrounding waters; weather observations, vertical soundings of the atomsphere, actinometry; aerial photography, geodetic surveys; flora and fauna of the land and sea; human acclimatization; and other related subjects.

G-10558
Petrov, V.N.
MOLODEZHNAYA STATION. Stantsiia Molodezhnaia. Chelovek i stikhiia, 1969, p.52-53, In Russian.
QC851.C39
Molodezhnaya Station opened on Jan. 14, 1963, located at an oasis on the Alasheyev Bight coast in Enderby Land. The oasis occupies an area of 8 to 9 sq km with several fresh-water lakes. Mean air temperature is about -11 C, and varies from -1 C in summer to -16 C in winter. About 200 days in a year have strong winds which attain velocities of up to 15 m/sec. The winds, as a rule, are accompanied by snow storms. Buildings are elevated to prevent formation of snow banks, and are equipped with modern instruments. The station has a diesel-electric plant, platform for rocket launching, radioroom, dwellings, clinic, recreation center, bath house, and laundry. Meteorological, geophysical, geological, glaciological, and oceanographic observations have been regularly carried out at Molodezhnaya Station, the station also serving as an intermediate point for intracontinental traverses.

G-10585
BUILDING IN ANTARCTICA. Nature, Jan. 17, 1970 225(5229), p.221-222
Q1.N2
One of the major problems in Antarctic construction is the preparation of foundations. Timber, native rock and earth fill have all been used. The feasibility of using concrete has been investigated by Barber, D.W. (1969; G-7308). Experiments indicate that Antarctic aggregates mixed with Portland cement are quite suitable for making concrete, with or without the addition of calcium chloride to accelerate hardening. Furthermore, concrete cylinders made in this way can be frozen repeatedly and thawed without loss of strength. The laying of concrete in simulated permafrost beds seemed to have no deleterious effects on the strength of the concrete itself because of the forced rapid setting, although of the five known types of Portland cement only the quick-setting type III proved suitable. Current field tests are being made to determine the optimum setting time in permafrost conditions.

G-10621
STUDY OF MARBLE POINT AS NEW SUPPORT BASE. Antarctic, Sept. 1971 6(3), p. 86
G845.A55
A study is being made of the feasibility of establishing a new base at Marble Point, which might eventually replace McMurdo Station as the main United States support facility in Antarctic. International science support needs in line with research programs, and commercial logistic support needs between 1971 and 1991, will be covered in the study. Two special projects have been included in the research program for 1971-72: (1) a study of the Marble Point airfield and a reevaluation and operational cost analysis of the McMurdo Station runways for wheeled and ski-equipped aircraft; and (2) future use of the nuclear power plant at McMurdo Station and an extensive reevaluation and cost analysis of updating the utilities.

G-10733
Dubrovin, L.I. , Petrov, V.N.
SCIENTIFIC STATIONS IN ANTARCTICA 1882-1963. New Delhi, Indian National Scientific Documentation Centre, 1971, 429p., Eng. transl. of G-5346 (Vol.3)
The book is a collection of data on scientific stations beginning with the winter stations on South Georgia in 1882-1883 (established by the German Antarctic Expedition under K. Schroder) up to 1963. The description of individual stations operated by 14 countries includes the physiographic features of the site, available technical and transportation equipment, and details of personnel and scientific equipment along with the nature of work and program of observations. Work carried out during the expeditions on shipboard as well as on temporary, remote-control, automatic stations is described. Concise information on shelters, field camps and supply depots is given. A bibliography by country and maps showing stations by year of operation are appended.

G-10742
Rigler, F.V.
FACE LIFTING AT THE SOUTH POLE. Trident, Nov. 1970 48(1), p.14-16
V415.J5T7
The U.S. Navy has been actively involved in advancing and supporting U.S. scientific and national interests in Antarctica for the past three decades. Operation Deep Freeze I (1955-56)

was the preparatory U.S. Naval support phase of the IGY project. A brief survey of the Navy's contributions in the Antarctic includes support operations for scientists and scientific programs; building construction, including completion of the Antarctic Development Squadron 6 shops and offices, and completion of the personnel building at McMurdo Station designed to winter 250 men; cargo operations; construction of fuel storage tanks and the nuclear reactor which provides McMurdo with light and heat; and maintenance of the six U.S. Antarctic stations. Plans are underway to construct a new facility at the pole to cost approx two million dollars and require an estimated 250 Seabees. It is speculated that the successful implementation of the Navy role in Antarctica may be emulated on the moon as scientific conquest of it expands.

G-10746
Everett, R.P.
JOURNEY TO THE ICE. Airman, March 1972 16(3), p.25-28
UG633.S1A528

A popular account is given of the author's observations as a passenger on the first C-141 mission of the season, transporting scientists and Naval personnel from Christchurch to Antarctica. The mission is the first of some 80 that the Military Airlift Command (MAC) will fly in support of the Navy's Operation Deep Freeze during the season. MAC will haul some 1600 passengers and 440 tons of cargo to the continent before the austral summer breaks up the 10,000-ft ice runway sometime in Jan. Included in the account are observations on the Starlifter, its crew members and its suitability for flying support missions; the general geographic and climatic features of the Antarctic continent and the types of scientific studies being conducted there; the flight from McGuire AFB to Christchurch, N.Z. with stops at Quonset Point Naval Air Station, R.I., Hawaii, and American Samoa; and the touchdown at Williams Field, Antarctica.

G-10751
Rigler, F.V.
PEACEFUL ATTACK ON A CONTINENT--A NATIONAL PROGRAM. Retired officer magazine, March 1969 25(3), p.22-25
UB413.R4

The present Navy commitment in Antarctica began in the mid-fifties and is still continuing there under the well-known code name Operation Deep Freeze. Approximately 400 officers and men are presently involved in Naval support operations. This group provides for the annual provisioning of stations, the construction of new facilities, over-all support of the U.S. Antarctic stations and runway facilities; and administers Air Development Squadron 6 which provides the area with transportation. The Antarctic Treaty and the assignment of the responsibility for planning, coordinating, managing, and funding the U.S. Antarctic Research Program of the National Science Foundation are especially significant to American activities in Antarctica. Among the scientific disciplines covered by U.S. Antarctic programs are biological and medical sciences, earth sciences, and atmospheric sciences. The expansion of the U.S. multidiscipline research activities into the bordering seas has been made possible by two research vessels--Eltanin and Hero. The construction and research objectives of these vessels are discussed.

G-10769
Arnold, C.L.
U.S. ANTARCTIC RESEARCH PROGRAM SCIENTIFIC SUPPORT STUDY. VOL. 1, SUMMARY REPORT. San Francisco, Bechtel, Inc., 1972, 25 p.

A long range plan developed for the National Science Foundation to make the best use of funds in support of the U.S. Antarctic Research Program includes an engineering evaluation of the support logistics and cost effectiveness study of various elements of the program. Primary station alternatives evaluated include military and civilian operation and construction, and relocation of present McMurdo operations to a new site at Marble Point. A Williams Field sub-base for McMurdo includes quartering of military air personnel at the air field. The various station cases and the programs developed are based upon engineering sub-studies pertaining to: cost study of wheel and ski aircraft operations; analysis of continued use of the PM3-A nuclear power plant at McMurdo; and the McMurdo Station utilities study. The impact which each case produces upon operations and construction, and relative 20-year cost differentials are briefly described. For abstracts on detailed reports of McMurdo Station/Williams Field Complex (Vol. 2) see G-10770; Marble Point Station (Vol. 3) see G-10771; and Engineering Sub-Studies (Vol. 4) see G-10772.

G-10770
Arnold, C.L.
U.S. ANTARCTIC RESEARCH PROGRAM SCIENTIFIC SUPPORT STUDY. VOL. 2, MCMURDO STATION/WILLIAMS FIELD COMPLEX. San Francisco, Bechtel, Inc., 1972, 127 p.

McMurdo Station and Williams Field are examined in respect to functions as a station for logistics support of the U.S. scientific program in Antarctica. To meet objectives of the National Science Foundation cost estimates and 20-year projections of total cost expenditures are proposed which consider the choice of civilian or military personnel to perform construction work and to implement the support logistics as the station complement. A sub-study considers whether the flight crews for the C-130 aircraft and support be housed permanently at McMurdo Station or at Williams Field. In each case; costs have been developed assuming that nuclear power plant PM3-A would be decommissioned in F.Y. 1974; cost estimates consider differences in productivity between civilian trades men and military labor in a construction program deemed necessary for a 20-year service life; construction schedules have been developed on the basis of total manhours required for completion, with yearly assignments determined from material delivery requirements using capability of existing resupply vessels.

G-10771
Arnold, C.L.
U.S. ANTARCTIC RESEARCH PROGRAM SCIENTIFIC SUPPORT STUDY. VOL. 3, MARBLE POINT STATION. San Francisco, Bechtel, Inc., 1972, 56 p.

A proposed Marble Point Station plan to create a station for logistics support of the U.S. scientific program in Antarctica permits a concise site and consolidates the living area, work laboratory, and airfield locations. The Station is designed to meet both functional and esthetic demands. Construction is provided by civilians. The use of modular buildings is intended, thus providing for ease of maintenance and operation. 20-year costs for two cases studied, including cost of construction, operation and support are: Military complement,

1,257,000 dollars; Civilian complement, 1,099,000 dollars.

G-10772
Arnold, C.L.
U.S. ANTARCTIC RESEARCH PROGRAM SCIENTIFIC SUPPORT STUDY. VOL. 4, ENGINEERING SUB-STUDIES. San Francisco, Bechtel, Inc., 1972. 151 p.

Findings and definitive recommendations on a series of sub-studies made on McMurdo Station to support the U.S. scientific program in Antarctica follow. Utility changes will provide significant improvement in station operation, pollution control, environmental factors, and efficiency. The PM3-A Nuclear Power Plant should be decommissioned at the earliest possible date and replaced by a diesel/electric generator. Cost comparison of existing aircraft logistical patterns indicate the need for an airdrome, utilization of pure jet aircraft in addition to C-130 aircraft, and modified cost accounting in the air operations budget. Marine transport studies show the possibility of cost savings using a mid-size container vessel and a ship of the Manhattan's characteristics. Alternate operational concepts for the Antarctic program, simulated by computer, recognize different equipment resources, station configurations, and operating strategies.

G-10807
FIRST OUTSIDE STUDY OF AMERICAN SUPPORT COSTS. Antarctic, Dec. 1971 6(4), p.118
G845.A55

The National Science Foundation has no immediate plans to transfer the main Antarctic support base at McMurdo Station to Marble Point. This season the Bechtel Organization, an engineering, construction, and management services firm, will make an over-all cost effectiveness study of the whole Antarctic support operation, but the Marble Point proposal occupies only 25 per cent of the operation. The consultant's study, to be completed by next March, will serve as a management tool, and any information or recommendations in the report will not be effective for four or five years at the earliest.

G-10810
BIGGER ICE-BREAKERS FOR AMERICA AND RUSSIA. Antarctic, Dec. 1971 6(4), p.121
G845.A55

The U.S.S.R. has two 25,000-ton nuclear-powered ships of the Arktika class under construction, which will each carry 10 helicopters and have a speed of 25 knots. The U.S. Coast Guard has ordered a new 12,000-ton ice breaker which is expected to be in service by 1974. A $52,681,485 contract has been let to build the ship, which will be the first of four to replace the Wind class ships. The vessel will have conventional diesel engines for normal cruising and gas turbines for maximum power, a novel hull shape, stronger hull structure, special steering features, an oceanographic system with a portable laboratory and data transmission systems, and greatly improved living quarters. The ship's maximum cruising range at 13 knots will be 28,275 mi, and it will be capable of a sustained speed of 17 knots. the ice breaker, which will carry two Sikorsky amphibious helicopters, 138 officers and men, and 10 scientists, will be able to advance through 6 ft ice at a steady 3 knots and ram its way through 21 ft thick ice.

G-10893
Brier, P.W.
SNOWDRIFT CONTROL TECHNIQUES AND PROCEDURES FOR POLAR FACILITIES. U.S. Naval Civil Engineering Laboratory, Port Hueneme, California. Technical Report, June 1972 R-767, 45p., 10 refs.

Accumulation of windblown snow causes an assortment of problems at polar facilities. In addition to curtailing personnel and vehicular movement, snowdrift accumulation may damage structures and disrupt aircraft operations. In an effort to develop techniques and procedures for alleviating snowdrift accumulation, scale-model studies on building shapes, orientations, and groupings were conducted in wind ducts, and field studies were conducted on snow collection systems. The scale-model wind duct studies of a camp showed that snowdrift accumulation can be reduced by elevating the camp on a snow platform, orienting the buildings 45-degrees to the snow-carrying wind, and placing the structures and utilities to permit easy snow removal. The field studies on snow collection systems on airfields showed 3- to 4-foot high windrows with a borrow pit on their leeward side are effective in controlling drift on skiways and runways when located on the upwind side of the surface to be protected.

G-10901
Romanov, A.A.
CHARACTERISTICS OF THE THICKNESS DISTRIBUTION OF FAST ICE IN THE MIRNYY OBSERVATORY AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.411-413, Translated from its Informatsionnyi biulleten' No.75, 1969. 8 refs.
Q115.S6862

The results are given of measurements of the snow-ice cover thickness and its bearing capacity between the coast and the ice edge in the Mirnyy Station area from 1956 to 1966. Thickness distribution of the fast ice depends on snow cover distribution and has 3 combination patterns in this area. The empirical areal distribution of fast ice thickness resembles a mathematical normal distribution. Using this law and having determined the average ice thickness, the probability of finding the fast ice thickness in any given range for any specific year can be computed. The practical application of patterns of distribution is given for unloading operations in which a ship must force the fast ice and also use its bearing surface to transport loads. In this area, proper design would require a snow-ice profile between Point Mabus and the ice edge just before ship's approach to fast ice.

G-10902
Romanov, A.A.
ABILITY OF THE R/V OB' TO OPERATE IN ANTARCTIC SEA ICE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.414-416, Translated from its Informatsionnyi biulleten' No.75, 1969. 5 refs.
Q115.S6862

The results of ice observations during voyages in Antarctic seas from 1955 to 1966 were used to determine the speed of the Ob', which belongs to the ice class of vessels of the reinforced Arctic ice type. Data are given on navigation of the Ob' during operations in water with icebergs, in drift ice during the melting period, and in young and residual ice during the freezing period. The technical or maximum safe speeds of the Ob' under various conditions can be used to determine navigation

time and speed of advance of ships of her class in Antarctic ice.

G-10907
Kudriavtsev, N.F.
NEW CHILEAN ANTARCTIC BASE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.428. Translated from its Informatsionnyi biulleten' No.75, 1969.
Q115.S6862

Construction of the new Presidente Eduardo Frei Station started by Chile on Dec. 3, 1968 in Ardley Bay near Bellingshausen Station is briefly discussed. On March 1, 1969 19 members of the winter party and the necessary equipment were delivered to the new station from Gonzalez Videla Station. The base began its regular observations on April 1, 1969, in accordance with the recommendations of the World Meteorological Organization and the Commission on Radio Communications.

G-10915
Romanov, A.A.
EFFICIENCY OF CHANNEL CUTTING IN THE FAST ICE OF MIRNYY AND OPTIMUM TIME FOR FORCING IT. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.453-456. Translated from its Informatsionnyi biulleten' No.76, 1969. 14 refs.
Q115.S6862

To determine the technical or maximum safe speeds during the cutting of a channel in the fast ice, the logs of the Ob' and the results of observations during the forcing of the fast ice at Mirnyy, Molodezhnaya, and Lazarev Stations in 1956-1966 were studied. The channel cutting efficiency, being a function of the thickness of the fast ice and of the snow cover depth, increases most markedly for ice thickness of less than 150 cm. The time for the completion of unloading operations on the fast ice, investigated near Mirnyy Station, depends on the structure, stratigraphy, formation, and disintegration of the fast ice. The optimum date to start forcing the fast ice is in the latter part of Oct. because the ice reaches total thickness. After investigating the fast ice just before a ship approaches, it is necessary to verify the channel forcing time against the cutting speed, proceeding with the analysis of the actual ice thickness distribution, snow depth, and fast ice width.

G-11001
U.S. NAVY'S 18TH YEAR OF SUPPORT FOR SCIENTISTS. Antarctic, Mar. 1972 6(5), p.156-157
H845.A55

More than 25 American scientists and about 2000 men from the United States Navy, Air Force, Coast Guard, Army and Marines, were involved in this season's Antarctic operations. The Navy's 18th consecutive year of logistic support for the United States Antarctic Research Program began on Oct. 8 when summer work began at McMurdo Station, and ended officially on Feb. 29 when the station was left to its winter isolation. Navy air support activities included an open field landing in Wilkes Land to deposit a 10-man French traverse team on the first stage of a journey from Carrefour to Vostok Station, flying four resupply missions to the party, and a four-helicopter skytrain mission to deliver New Zealand scientists and supplies to the mountain ranges of Victoria Land for a 2-mo geological mapping survey. Navy Seabees carried out a varied construction program, including work on the new geodesic dome complex at the Pole Station and construction on the Siple Station, building of a new incinerator and a sewage treatment plant at McMurdo Station, preparation of a new communications transmitter site, and other projects. The Navy's operations were supported by three Coast Guard icebreakers during the season - Northwind, Staten Island, and Southwind.

G-11009
TOURIST SHIP AGROUND IN SOUTH SHETLANDS. Antarctic, Mar. 1972 6(5), p.175
G845.A55

The Linblad Explorer, a 2500-ton tourist ship on a luxury summer cruise to South Georgia and the west coast of the Antarctic Peninsula, was caught in a 60-knot gale on Feb. 11 and ran aground in Admiralty Bay, King George I., South Shetland. The engine-room of the ship was flooded, the propeller and rudder were badly damaged, and there were holes in several places. All the passengers, and most of the crew, were put ashore in the ship's lifeboats, and later taken aboard the Chilean Piloto Pardo, the first ship to answer the radio call. Attempts by the Yelcho, which arrived a few hours later, to refloat the damaged ship failed. By Feb. 14 ships from four other nations had joined the Chileans. On Feb. 28, the Lindblad Explorer had been refloated and was under tow.

G-11012
GEODETIC DOME COMPLEX AT SOUTH POLE IN 1974. Antarctic, Mar. 1972 6(5), p.183
G945.A55

Early in 1974 a $3.5m geodesic dome complex will replace the Amundsen-Scott South Pole Station, now buried under 20 ft of ice and snow. The new station, designed to resist the drift of snow, is expected to last 10 to 15 yr. The aluminum framework dome will be 164 ft in diam and 50 ft high, and will be covered with a thin aluminum skin over ribbed corrugated steel arches, housing three two-story steel panel type buildings. A system of tunnels to carry utility lines, provide passageways, and house various facilities (726 ft long and 46 ft wide) will be included. One-third of the construction was completed by Navy Seabees this season. Construction continued on the new Siple Station which is expected to be occupied in the 1973 winter.

G-11033
Rogers, A.F. , Sutherland, R.J.
ANTARCTIC CLIMATE, CLOTHING AND ACCLIMATIZATION. U.S. Air Force. Aerospace Medical Research Laboratory. Technical report, Nov. 1971 AMRL-TR-71-112, 143p., Contract No. EOOAR 69-0068, AD-734 071, 62 refs.

A detailed computer analysis was made of the clothing worn by the members of the Trans-Antarctic Expedition, and the relevant climate data. The analysis covers a period of just over 14 mo and includes the 2,158 mi journey across Antarctica. The cold stress was severe. No evidence of whole body acclimatization to cold in man could be found. The clothing worn was clearly shown to be more closely correlated with temperature than with windchill. The measured clo values of twenty-eight different assemblies of Antarctic clothing were compared. A simple direct relationship between a weighted 'number of layers' count and the clo value of an assembly was shown to exist. This relationship is of

immediate use in comparing the relative thermal insulation of two cold weather clothing assemblies. Other data, including weight, fat thickness and sleep records, are discussed. The data presented are consistent with the suggestion that man creates and controls his own microclimate.

G-11056
SNOW ROAD CONSTRUCTION AND MAINTENANCE MANUAL. Port Hueneme, California, U.S. Naval Civil Engineering Laboratory, 1972, 17p.

Elevated snow roads are desirable in polar regions to allow fast transportation with wheeled vehicles and thus eliminate the requirement for unwieldy tracked vehicles. The manual describes nine basic steps required to produce high-strength, durable, elevated snow roads: site selection, staking, elevating, leveling, mixing, releveling, rolling, surface hardening, and providing transition areas. Required equipment for the construction of these roads is listed and the purpose and use of the various pieces are set forth.

G-11075
Peterman, K.R. , Tucker, A.J.
CURRENT STATUS OF STATION 019 MCMURDO, ANTARCTICA. Texas. University at Austin. Applied Research Laboratories. Technical report, Feb. 29, 1972 ARL-TR-72-15, 25p., Contract No. NSF-560, 4 refs.

Several improvements were made to Station 019 during the Austral winter of 1971 and the Austral summer of 1972. The station equipment improvements included the incorporation of an Automatic Control Unit (ACU) in the station, the exchange of the sampled-Doppler digitizer with a Continuous Count Integral Doppler (CCID) digitizer, and the fabrication and installation of an oven for the Satellite Time Recovery Unit (STRU). The physical improvements to the building included repainting the inside of the Jamesway, partitioning the building into two rooms, and replacing the diesel fueled space heater.

G-11155
Keeton, J.R.
SULFUR CONCRETE FOR POLAR CONSTRUCTION. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Jan. 1972 N-1200, 25p., Distribution limited to U.S. Government agencies only; Proprietary Information; Other requests for this document must be referred to the Naval Civil Engineering Laboratory. 5 refs.

Experimental studies on sulfur concrete in the laboratory and at McMurdo Station, Antarctica are described. Sulfur concrete mixtures containing 12-1/2 per cent and 15 per cent sulfur by weight of aggregate showed high tensile, flexural, and compressive strengths as well as high Young's Modulus in the laboratory. With the equipment utilized in Antarctica, adequate temperatures were not obtained to produce satisfactory sulfur concrete

G-11162
INTERNATIONAL SHIP TYPES. Internationale Schiffstypen. Feb. 1971, Jahrbuch der Schiffahrt 1972, Berlin Transpress VEB Verlag fur Verkehrswesen. p.101-116, In German.

Various general types of ocean vessels are illustrated by the detailed discussion of a specific vessel in each type. Included is the Lindblad Explorer, a Norwegian ship for exploration of the islands and water around Antarctica. Specifications, photograph, and construction details are given.

G-11168
NAVAL PLANE LANDS ON THE SNOW AT THE ALMIRANTE BROWN SCIENTIFIC STATION OF ANTARCTICA. Un avion naval aneviza en la estacion cientifica "Almirante Brown" en la Antartida. Antartida, Dec. 1971 No.1, p.24-25, In Spanish.

For the first time on May 2, 1971, a plane landed on the difficult Terrain at Brown Station. This feat was achieved with a Porter Pilatus 4-G-1 and signified the end of Brown Station's winter isolation

G-11223
Hajek, E.R. , Saiz, F.
MICROCLIMATIC OBSERVATIONS IN THE "COPPER MINE" SHELTER. Observacicnes microclimaticas en el Refugio "Copper Mine". Instituto Antartico Chileno. Boletin, 1969 No.4, p.12-18, In Spanish. 6 refs.

Two wooden structures, used by scientists during a 64-day stay on Robert Island, served respectively as shelter and laboratory (for the study of edaphic and muscicoline fauna). The microclimates inside and outside the shelter are compared and the value of the protection afforded to the scientists is considered. Inside temperature averaged 12C above that outside, with maximum inside temperature less dependent than the minimum on ambient conditions. The only heating devices used were cooking stoves and Petromax lanterns. Humidity was generally greater outside, but high inside humidity and high temperatures coincided, creating unpleasant living conditions. The shelter should have had a double door, regulated ventilation, impermeable coating, separate rooms, and a system to eliminate steam from cooking. Temperature and humidity graphs and a floor plan are included.

G-11258
Bellars, A.R.M.
GENETIC DEFECTS IN ANTARCTIC DOGS. Journal of small animal practice, 1971 Vol.12, p.493-500, 22 refs.

The occurrence of congenital entropion and true haemophilia in a closed population of working British Antarctic Survey sledge dogs is described. The difficulties of determining the patterns of inheritance are discussed.

G-11259
Smith, B.M.E.
AUTOMATIC PLOTTING OF AIRBORNE GEOPHYSICAL SURVEY DATA. Journal of navigation, Apr. 1972 25(2), p.162-175, 7 refs.
VK1.I5545

When post-flight track plotting is required for geophysical survey, use can be made of both the initial and terminal position fixes to correct the dead-reckoning track and hence improve on the in-flight version. This technique is applied to compute the track of aircraft conducting ice thickness measurements in the Antarctic, and the effect of certain errors is evaluated. The algebraic results are equally applicable in parts of the world where better navigational aids are available. A relation is derived between the track plotting errors and the errors in the geophysical measurement such that the precision of one is not degraded by errors in

the other.

G-11275
REVIEW OF ARGENTINE ANTARCTIC AIR FORCE ACTIVITY 1965/1966 UP TO DEC. 2, 1965. Resena de la actividad de la F.A.T.A 1965-1966 hasta 2 de diciembre de 1965. Antartida argentina, Jan. 1966 9(16), p.22-25, In Spanish.

A flight over the South Pole by a Douglas FA-05 and two single-motor Beavers in November 1965 is described. The Douglas flew from Argentina to Matienzo Station and then to Belgrano Station, where it was used in an emergency rescue mission. Under changing weather conditions it covered 13,950 sq km before finding the crashed plane it was searching for. Later, joined by the Beavers, the Douglas flew over the South Pole to McMurdo Station.

G-11276
GENERAL SAN MARTIN ICEBREAKER. Rompehielos "Gral. San Martin". Antartida argentina, Jan. 1966 9(16), p.26-27, In Spanish.

The icebreaker General San Martin was built in Germany in 1954 for Argentina. The ship has diesel-electric propulsion with 2 stern propellers on shafts turned directly by DC motors with a normal power of 3150 kw each. The ship is 84.7 m long, 19 m wide, and has a maximum speed of 16 knots, a displacement of 4850 tons, and a total of 9 anchors. An oceanographic laboratory, meteorological center, radiosonde equipment, and a photographic laboratory give the San Martin considerable research potential. In 1959 a cosmic ray measuring device was installed. Along with a crew of 130, room is provided for 15 passengers. Two 10 cm radars and two sonar devices make up the navigation equipment.

G-11283
Dezerega C., V.
FUTURE OF ANTARCTIC TELECOMMUNICATIONS. El futuro de las telecomunicaciones antarticas. Instituto Antartico Chileno. Boletin, 1970 No.5, p.31-34

In September 1969, a Meeting of Telecommunications Experts was held in Buenos Aires. The meeting concluded with recommendations including: more rapid distribution of meteorological data, provisions of better facilities for the collection of auroral data, improved provisions for response to emergencies including radio silence between H + 00 and H + 05 in case of emergency calls. Certain technical and political problems such as codes, frequencies, types of messages, uniformity of transmission methods were not solved. However, the countries involved showed sufficient concern to assume that the world telecommunications network will continue to improve.

G-11285
AERIAL BRIDGE IN ANTARCTICA. Puente aereo en la Antartida. Aero espacio, Feb. 1969 29(319), p.16-19, 52, In Spanish.

An emotional description of the resupplying by air of Matienzo Station during Nov. 1968. H-11 and H-12 helicopters as well as C-118's were used to transport 178,810 kg at a rate of 2,429 kg/hr in conjunction with the General San Martin icebreaker. A total of 111 flights were made from the icebreaker to Matienzo to bring in personnel, fuel, food, and other supplies. Matienzo continues to function.

G-11314
Wonlschlag, D.E.
INVENTORY-CATALOG; USARP BIOLOGICAL LABORATORY; MCMURDO SOUND, ANTARCTICA; CAPE HALLETT, ANTARCTICA. Stanford University, California, 1963, 53p.

The inventory-catalog is produced under a contract between the NSF and Stanford University which provides for supply and maintenance of the US Antarctic Research Program Biological Laboratories at McMurdo Sound and Cape Hallett. The compilation indicates supply and equipment items available at the laboratories on or about March 1, 1963.

G-11339
Pailberth, B.
DISPOSAL OF RADIOACTIVE WASTE MATERIAL IN THE ICE CAPS OF THE WORLD. U.S. Army Cold Regions Research and Engineering Laboratory, TL 361, Aug.1972, 19 refs., AD-748 401, Translation of Schweizerische Zeitschrift fur Hydrologie, 23 (1) 1961, p.263-284. 4 refs.

The problem of the disposal of wastes from fission materials is discussed in terms of preventing the scattering of these products in amounts harmful to human life. Highly active fission isotopes with short half life disintegrate swiftly and do not scatter. The few with long half life need only to be delivered into the general circulation--primarily the oceans-- at rates slow enough to prevent local concentrations. Those isotopes with medium half life present the greatest danger and must be enclosed for a guaranteed period of 1500 years. The ice caps of Greenland and Antarctica are ideally suited for the disposal of these radioactive wastes. The areas involved are large: Greenland 2,000,000 sq km, Antarctica 14,000,000 sq km; there is little or no meltwater to enhance the scattering of waste materials; the temperature, viscosity, and plasticity of the ice are such that they could receive and store the dangerous materials safely for the necessary time periods. Finally, transporting the wastes to the ice caps is considered with regard to economics, technical feasibility, and safety. The transportation aspect is regarded as not insurmountable but requires additional study.

G-11416
MAIN AMERICAN SUPPORT BASE NOT MOVING TO MARBLE POINT. Antarctic, June 1972 6(6), p.188
G845.A55

McMurdo Station, the main American support base in the Antarctic is likely to remain on Ross I. The Marble Point proposal, which was included in the study of support costs made for the National Science Foundation by the Bechtel Corp. last season appears to have been shelved because of the cost. One major change likely to be made in the next few years would be the closing of the nuclear power station on Observation Hill, which has provided power for McMurdo Station since 1962. Only three ski-equipped Hercules aircraft will be available for support operations next season. The support force will be slightly larger than usual. Construction will continue on the geodetic dome complex which will replace the Amundsen-Scott Station, and the completion of Siple Station in Ellsworth Land is planned.

G-11426
GROUNDED TOURIST SHIP NOT SERIOUSLY DAMAGED.

Antarctic, June 1972 6(6), p.219

When the Antarctic tourist ship Lindblad Explorer ran aground in Admiralty Bay, King George I., South Shetlands, on Feb. 11, there were conflicting newspaper reports from South America about the extent of the damage to the ship, and the passengers' privations. The Lindblad Explorer was said to have been holed in several places and her engine-room flooded; the passengers were supposed to have spent 8 hr in freezing temperatures at an old British base on King George I. Reports from the owners of the ship and the towing tug give a different account. When the vessel was blown on to some unchartered rocks, the passengers were transferred to lifeboats where they spent about 4 hr in bitter cold and driving snow. When it was realized that the Lindblad Explorer would not capsize, the passengers were taken back on board until the arrival in the afternoon of the Chilean vessel Piloto Pardo, when they were again transferred. The passengers enjoyed their seven days aboard the Piloto Pardo, during its routine tasks and return to Punta Arenas. When the Lindblad Explorer was reached by the Arctic on Feb. 23, it was found that the vessel had suffered damage only to the bottom of the outer hull.

G-11438
Paige, R.A.
BUILDING FOUNDATION STUDY AT MCMURDO STATION, ANTARCTICA. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Sept. 1972 N-1248, 18p., AD-750 270

The Naval Civil Engineering Laboratory (NCEL) investigated problems concerning subsurface temperatures, snow accumulation, and potential frost heaving beneath buildings at McMurdo Station, Antarctica. Two buildings were selected for a comparative study of their effects upon earth-fill foundation and underlying permafrost. One building has an open blow space beneath it for air circulation and the other is completely enclosed. Snow drifting and accumulation beneath buildings with an open blow space is detrimental because it engulfs utility pipes and renders them inaccessible for maintenance. It is also a source of melt water which could cause fill erosion or frost heaving. It is concluded that any building can be enclosed as necessary because: (1) permafrost consists predominantly of solid rock; there are no zones of high-ice-content silty soils typical of the Arctic; (2) the buildings protect the frozen ground from solar and atmospheric heat and tend to prevent thawing; (3) the enclosed building has shown no detrimental foundation effects since its completion in 1964. The earth-fill pad is frozen solid and the area beneath the building is clean and dry.

G-11442
EMERGENCY SHELTERS IN ANTARCTICA. Refugios Antarticos de emergencia. Buenos Aires. Instituto Antartico Argentino. Boletin, Nov. 1966 2(20), p.6-9, In Spanish.

Snow is the basic material for constructing shelters to protect from cold and wind. Three types of structures exist: a one-man hole with two slanted blocks of ice for a roof, 3 holes forming a "T" with a common entrance, and a circular cave under the snow surface with individual chambers around the edge. Containers for fire fighting are described. Drawings accompany all descriptions.

G-11498
WORLD'S MOST POWERFUL ICEBREAKER WILL CUT THROUGH 21-FT-THICK ICE. Ocean industry, Oct. 1972 7(10), p.43

GC1.022

A 400-ft icebreaker capable of cutting through ice up to 21-ft-thick is being built for the U.S. Coast Guard for use in the Arctic and Antarctic. The Polar Star is equipped with a gas turbine capable of generating up to 60,000 hp for ramming operations and diesel electric engines rated at a total of 18,000 hp for normal ice breaking operations. It is also equipped with two flight decks for helicopter reconnaissance operations, two oceanographic labs, a meteorological lab, two portable vans, and a computer center. Accommodations will be provided for 155 crew members and officers, and 10 scientists. The cruising speed of the vessel is 17 knots.

G-11520
Hoffman, C.R.
SINGLE-LINE, HEAT-TRACED PIPING SYSTEM FOR POLAR REGIONS. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical report, June 1971 R-733, AD-886 566

Single-line piping systems for the distribution of freezable liquids, such as water and sewage, were investigated for navy polar application. The investigation, which included the testing of three preassembled pipe systems, shows that a commercially available system consisting of preassembled, insulated, jacket X-50 piping freeze-protected with electro-wrap heat-tracing tape is well suited for navy polar application. An X-50 piping system containing one to three pipes appears to be more cost effective than an equivalent multiline utilidor piping system, but esthetics or other special considerations may favor a utilidor sytem of four to six pipes. Proposed outline specifications delineating material options are presented to facilitate procurement of this cold-weather piping system. Also, performance information is provided on the full-scale, single-line, liquid distributing systems at Point Barrow, Alaska, and McMurdo Station, Antarctica.

G-11521
DAKOTAS IN THE ANTARCTIC. Washington, D.C., U.S. Naval Support Force, Antarctica, 1970, 30p., Numerous refs.

The history of the DC-3, or Dakota, in Antarctica is reviewed. Experiences related to the plane's use are given in chronological order for the decade of Operation Deep Freeze. Before introduction of the Hercules, the DC-3 was the principal means of transportation in Antarctica and successful completion of the IGY program depended on it. Appendices cover DC-3 specifications, information on the Soviet twin-engine LI-2, and Argentine DC-3 operations.

G-11537
Humphries, G.E.
MONTHLY PROGRESS REPORT -- JANUARY 1963; INLAND ANTARCTIC STATION DESIGN; CONTRACT AT(30-1)-3111 PHASE II. U.S. Atomic Energy Commission, Contract AT(30-a)-3111. ACNP-63801, Washington, D.C. Atomic Energy Division. Nuclear Power Department, Feb. 11, 1963, [28]p.

Work was started in Jan. 1963 on the final design of the conceptual plant developed under Contract AT(30-1)-311 and reported in ACNP-62848. The program has been re-directed to make the station applicable to a South Pole environment

and to use PM-1 reactor vessel components, PM-1 system parameters and the ANPP tubular Core 2. In addition, the scope of work has been revised to include power plant equipment only. No work will be performed on buildings, service facilities and tunnels. The preliminary Management Scheduling Network indicates that the work can be accomplished within the contract dates of January 1, 1963 and June 30, 1963. Final revisions are being made in the network and the first computer run will be made early in February.

G-11606
Fowler, A.N.
ANTARCTIC SUPPORT ACTIVITIES IN DEEP FREEZE 72. Antarctic journal of the United States, July-Aug. 1972 7(4), p.129-131
G845.A56

For the Antarctic Support Activities command, the Deep Freeze 72 summer operating season extended from Oct. 7, 1971 to Feb. 26, 1972, and was successful in meeting the requirements for support of the research program. Most of the work during the last season was much the same as in recent seasons, and significant, new, or unusual developments are discussed. On Feb. 1972, Byrd Station was closed as a winter-over station after being occupied continuously since Feb. 13, 1962. In the future, the station will be used as a surface camp with skiways, radar controlled approach facilities for all-weather operations, weather observing and reporting facilities, a depot for fuel and supplies, and alternate landing site when planes cannot land safely at Williams Field. The ship mooring facilities at McMurdo Station were improved, a new firehouse was occupied on Feb. 14, 1972, and the nuclear-powered water distillation plant has increased its production. A cleanup of Hallett Station was begun in 1971 and completed during Deep Freeze 72. To halt the cycle of trial and error and of relearning old lessons, an Antarctic Lessons Learned book has been started. First publication and use of the book is planned for the annual training cycle of support personnel, which comes July and Aug. 1972. Examples of lessons learned are given.

G-11607
Boyd, H.F., III , Perry, J.E., Jr.
CONSTRUCTION REPORT DEEP FREEZE 72. Antarctic journal of the United States, July-Aug. 1972 7(4), p.131-133
G845.A56

Under the general supervision of the U.S. Naval Support Force, Antarctica, the Naval Mobile Construction Battalion 71 (NMCB-71) deployed from Davisville, R.I., with 8 officers and 216 enlisted men and started or finished some 20 projects at U.S. antarctic stations in the 1971-1972 austral summer. At McMurdo Station the construction of the fire station/telephone exchange facility and approx. 50 m of the Elliot Quay protective facing was completed. Four T-5 prefabricated buildings were dismantled, one sent to Amundsen-Scott Station, another to be erected at Williams Field, and two stored. The major earthwork project was the leveling of the helicopter pad. Pipeline installation, communications transmitter building construction, and the status of other projects are reviewed. The most significant work accomplished at the new Pole Station complex was the completion of snow processing for the geodesic dome foundation. The major construction during Deep Freeze 73 is briefly summarized.

G-11608
Linn, P.E.
NUCLEAR POWER OPERATIONS DEEP FREEZE 72. Antarctic journal of the United States, July-Aug. 1972 7(4), p.133-134
G845.A56

During calendar 1971, the PM-3A nuclear power plant at McMurdo Station had operated continuously for over 183 days. Operating data for 1971, as compared to previous years (since 1962), are tabulated. A special maintenance team of 14 technicians plus a supervisor was formed at the Naval Nuclear Power Unit at Fort Belvoir, Va., and sent to the field in segments to do mechanical, electrical, and instrumentation work, which was completed in 46 days. A new copper-nickel, flash evaporator, water distillation unit, placed in service in Feb. 1971, and producing 54,500 liters a day, performed well throughout the year. A second unit, having a maximum capacity of 54,500 liters a day, was installed in Feb. 1972, and a third unit will be delivered to Antarctica this coming season. The replacement crew arrived in Oct. 1971 and working alongside their predecessors for 30 days, took over operation of the plant in Nov. 1971.

G-11609
Kirkpatrick, T.W. , Anderson, P.J.
U.S. SHIP OPERATIONS DURING DEEP FREEZE 72. Antarctic journal of the United States, July-Aug. 1972 7(4), p.134-136
G845.A56

Logistics during Deep Freeze 72 called for 6 ships: three U.S. Coast Guard icebreakers of the Wind class, each with two HH-52A helicopters, and two dry cargo vessels and one T-5 tanker operated by the Military Sealift Command (MSC). USCGC Staten Island operated in the vicinity of Deception Island and Palmer and McMurdo Stations; Northwind near Hallett and McMurdo Stations; and Southwind at Palmer Station and in the Amundsen and Bellingshausen Seas. USNS Wyandot (T-AK-283) called at Palmer and McMurdo Stations, while USNS Private John R. Towle (T-AK-240) and USNS Maumee (T-AO-149) called at McMurdo. An account of U.S. ship operations during Deep Freeze 72 from Nov. 1971 to March 1972 is given.

G-11613
Brier, F.W. , Paige, R.A.
SNOWDRIFT AND FOUNDATION STUDIES FOR THE NEW SOUTH POLE STATION. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Nov. 1972 N-1249, 35p., AD-753 192, 16 refs.

A two part study was conducted to determine the snowdrift characteristics of the new South Pole Station and properties of snow foundations at the South Pole. Snowdrift characteristics were studied using 1:150 scale models in a wind duct and 1:10 scale models in the field. From the scale model tests, areas of high and low snow accumulation rates were determined for a static undisturbed state in the vicinity of the station. The physical properties of natural and compacted snow were determined for the South Pole and three load settlement tests were conducted on different foundation materials. The load settlement tests showed that the settlement rate of footings on natural snow is several times greater than footings on compacted snow.

G-11647
Sullivan, J.
PETER, PETER, DEEP SNOW BEATER HELPS MAKE LIFE A

WEB BIT EASIER. Sealift magazine, April 1972 2 (4), p.10-11

The performance of logistics equipment, cargo operations, and construction procedures related to Operation Deep Freeze are described. The Peter Snowmelter, which packs snow into a stable base for building foundations, digs trenches, and prepares pads for buildings inside the geodesic dome, is being used by Seabees to speed construction at Amundsen-Scott Station. Logistical sea and air support, construction plans for Amundsen-Scott Station, and a few other points are covered in this article of interest to the general reader.

G-11651
Anderson, P.J.
ANTARCTIC SUPPORT. Naval aviation news, Feb. 1972, p.24-27
VG93N8

The four phases of air operations in a Deep Freeze season are described and include: deployment from the United States to New Zealand, movement of cargo and passengers to Antarctica, air support within Antarctica and finally, redeployment. All of these activities occur simultaneously throughout the season, although deployment and redeployment are emphasized at the beginning and end of the season, respectively. Most of this support is provided by the Navy and is the responsibility of Task Force 43, Commander, U.S. Naval Support Force, Antarctica. A few of the scientific projects supported by Squadron VXE-6 are described and illustrate the type of operations occurring during an almost 6-month summer season.

G-11751
Brier, F.W.
ERECTION INSTRUCTIONS FOR UNHEATED STORAGE SHELTER AND EQUIPMENT REPAIR SHOP IN POLAR REGIONS. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Nov. 1972 N-1247, 25p., 2 refs.

An investigation of available commercial building systems showed that the Fold-A-Way building was inexpensive and easily erected, and could function as a heavy-equipment repair and maintenance shop or an unheated storage shelter when used in conjunction with building accessories developed by the Naval Civil Engineering Laboratory. These accessories are a timber foundation and entrance ramp, anchoring system, an equipment door cover, and a field erection boom. Erection procedures and instructions for the Fold-A-Way building and the accessories are presented.

G-11769
Orr, N.W.M.
FEEDING OF SLEDGE DOGS ON ANTARCTIC EXPEDITIONS. British journal of nutrition, 1966 Vol.20, p.1-12, 7 refs.

The diets of sledge dogs at a British Antarctic sledging base were studied both at base and during sledge journeys, and samples of the diets and the relevant faeces were analyzed. Changes in weight were related to calorie intakes. The dogs' calorific requirements varied considerably according to their activity - 2500 kcal/dog daily being just sufficient to maintain body weight if idle, 5000 kcal/dog insufficient for a dog pulling a heavy sledge over long distances. Seal meat was found to be the most beneficial and most satisfactorily absorbed diet. The artificial diets pemmican and Nutrican were adequate to maintain body weight if the routine ration was doubled, but were uneconomical in that large quantities of nutrients were passed in the faeces.

G-11776
Robinson, W.
UTILITY TUNNEL EXPERIENCE IN COLD REGIONS. American Public Works Association. Special report, 1971 No.41, p.125-138, 16 refs.

The cold regions can be divided into zones of seasonal frost, discontinuous permafrost and continuous permafrost. In each zone stable and unstable soils exist. Utility tunnels have been built in, on, and above both types of soil in all three zones. However, other methods of distributing utilities are also present for each situation. Direct burial (except in unstable permafrost) is common for water lines with recirculation, insulation and/or electric heaters used to provide additional thermal protection if needed. In areas of unstable permafrost above-grade insulated pipelines have been constructed since burial there can result in direct damage by freezing or indirect damage caused by thawing of the surrounding soil. Utilidors are frequently used when steam or hot water must be distributed from a central heating plant. Steam lines within a utilidor are easier to maintain and repair than lines buried in the ground. Exposed utilidors have also been constructed to avoid costly blasting of rock. Others serve as passageways. The elimination of snow control, traffic interference and esthetic problems and the combined use as a passageway are further justifications for buried utilidors. Since World War II few, if any, utilidors have been buried in unstable permafrost in North America but in Russia such systems have been built. They are ventilated to prevent progressive thawing of supporting soils. In North America several unventilated utilidors have been buried in stable permafrost. In unstable permafrost elevated utilidors are common. Where buildings are elevated above unstable permafrost, utilities are often routed in an insulated crawl space below the first floor. This space, which is warmed by heating system mains, not only prevents utility freeze-ups but also provides increased thermal comfort within the structure.

G-11787
Hall, D.N.
LAND NAVIGATION FOR TRAVELLERS AND SMALL EXPEDITIONS. Geographical journal, Sept. 1972 138(3), p.339-346, 25 refs.
G7.R91

This is the first of a series of papers on matters relating to survey on expeditions. It covers a practical approach to navigation on land, starting with a description of preparation at the home base. This includes the assembly of information on terrain and weather, the study and selection of maps and possibly aerial photographs, and finally the collection of the correct instruments for the method of navigation selected and the accuracy required. Once in the field every piece of navigational information is brought into play to find the correct route and position. Finally, some general notes are given about navigation in the Arctic and Antarctic deserts, and in forests.

G-11884
Groover, E.E.D.
SEABEES OVERHAUL MCMURDO POWER PLANT. Navy civil engineer, Winter 1972 13(9/12), p.22-23

In Jan. 1968 it was determined that the

Navy's PM-3A nuclear power plant located at McMurdo Station and in its 10th year of operation, should be overhauled. The actual work performed consisted of replacement of the turbine rotor, nozzle block, inter-stage diaphragms, labyrinth seals, and exciter bearings as well as complete maintenance on the remainder of the turbine-generator set. The fact that a major project of such technical intricacy was successfully carried out at a remote station such as McMurdo with its extreme environment is unusual in itself. Additionally, the overhaul was done entirely by Seabees instead of turbine specialists which makes the accomplishment particularly noteworthy.

G-11886
Zeller, E.J. , Saunders, D.F., Angino, E.E.
PUTTING RADICACTIVE WASTES ON ICE: A PROPOSAL FOR AN INTERNATIONAL RADIONUCLIDE DEPOSITORY IN ANTARCTICA. Bulletin of the Atomic Scientists, Jan. 1973 29(1), p.4-9, 50-52, 18 refs.
TK9145.A84

Permanent disposal of radioactive wastes under the Antarctic ice cap would remove the wastes from populated areas and from all contact with the biosphere. The polar climate and the low temperature of the ice would furnish a sink for the heat given off by the radioactive waste canisters, and the large subsurface area of the ice would provide adequate space so that the canisters would not be in close contact with each other. All available evidence indicates that if the wastes were fused into a solid glass matrix, they could be practicably and safely transported to the interior of the ice cap. If placed on the surface of the ice, they would melt their own emplacement shafts which would rapidly reseal by freezing and plastic flow. The containers would sink slowly to the ice-rock interface where they would remain safely isolated from the biosphere for more than 250,000 years. Although the Antarctic Treaty of 1959 prohibits radioactive waste disposal there, it also provides specifically for amendments that are desired by the signatories, many of whom have or will have high-level waste disposal problems. The major problems to be solved to establish the feasibility of this approach are discussed.

G-11905
WINTER FLIGHTS TO MCMURDO STATION BEGIN FIELD SEASON. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.264

This season's field activities began with the early September arrival at McMurdo Station of 100 scientists and support personnel on four LC-130 Hercules flights from Christchurch, N.Z. Two scientific projects began shortly after the arrival at McMurdo -- a study of the freezing resistance in antarctic fishes, and a model of freshwater and terrestrial ecosystems in the dry valleys. The supply system at the station was inventoried and the Nimbus IV satellite was turned on for weather forecasting. Adverse ice conditions were encountered which are expected to curtail wheeled aircraft operations and overice traverses.

G-11930
Lopez Rubio, S.E.
EXPLORATION AT THE ANTARCTIC BASE GENERAL BERNARDO O'HIGGINS. La exploracion en Base Antartica "General Bernardo O'Higgins". Santiago de Chile. Instituto Antartico Chileno. Boletin, 1971 No.6, p.27-32, In Spanish.

The use of various means of transportation at General O'Higgins Station is discussed. The rescue of a Sno-Cat from a crevice and the benefits of using air transportation, either Twin Otter planes or helicopters, are described. The helicopter is considered very adaptable, maneuverable, to have great cargo capacity, and be excellent for rescue missions and coordination between expeditions.

G-11931
Gallagher, P.A.
MSC SHIPS DELIVER VITAL SUPPLIES TO MEN ON "ICE", COAST GUARD CUTS PATH FOR SHIPS. Sealift, March 1971 21(3), p.7-9

A summary account of resupply logistics by sea to McMurdo is given. Supply routes, transportation modes, ship reinforcing, work of ice breakers, tonnage, and Operation Deep Freeze administration are mentioned.

G-11948
Romanov, A.A.
STUDY OF ICE NAVIGATION CONDITIONS OF SOVIET EXPEDITION VESSELS IN THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.75-77. Translated from its Informatsionnyi biulleten', No.80, 1970. 2 refs.

The physiographic aspect of ice navigation (ice regime characteristics and seasonal variations) and the ice cover as a specific medium in which navigate are examined. Antarctic ice has a lower mechanical strength than arctic ice because of its uneven structure, providing greater safety for ship's hull but interfering with movement because of friction. Icebergs reduce technical ice speed considerably; close ice of 9-10 tenths permits steady sailing; pressure ice with more than 1-2 points is virtually impassable. Great difficulty is caused by young growing ice, when the ice cover is strong, snow plentiful, and both ice rafting and hummocking prevalent. These and other details are based on the ship's log of the Ob'.

G-12000
Wadhams, P.
SOVIET RESEARCH VESSEL PROFESSOR ZUBOV. Polar record, Sept. 1972 16(102), p.417
G575.P6

The Soviet research ship Professor Zubov operated by the Arctic and Antarctic Research Institute, Leningrad, displaces 6900 tons (5500 grt) and is 124 m in length with a beam of 17 m, making her one of the largest oceanographic ships in service. Twin-screw diesels of 8000 hp give a speed of 17 knots and the hull is strengthened for ice navigation. A significant drawback is the lack of precision navigation systems. The vessel can accommodate a complement of 158, including up to 80 scientists and technicians, and has an extensive computer installation. Since entering service in 1967, Professor Zubov has made nine cruises to Arctic and Antarctic waters carrying out studies in physical oceanography, meteorology, and air-sea interaction.

G-12012
Blakley, J.W.
SOUTH POLE NUCLEAR POWER PROGRAM. INTERIM REPORT, JUNE 1965. VOLUME II --POWER PLANT COMPLEX DESIGN. Aerojet-General Nucleonics. Gas-Cooled Systems Division,·[207]p., AN-1424

This volume presents the preliminary design

of a nuclear power plant complex capable of supplying 1000 kw net electrical power to sustain scientific endeavors at the U. S. South Pole Station. A design data summary, a detailed description of the plant complex components, and a preliminary safety analysis of power plant operation and transport are included. Detailed instrumentation and controls functions are tabulated.

G-12093
Humphries, G.E.
FINAL REPORT; CONTRACT AT(30-1)-3111; BYRD STATION STUDY. Washington, D.C., Atomic Energy Division, Nuclear Power Department, Dec. 12, 1962. U.S. Atomic Energy Commission, Contract AT(30-1)-3111. ACNP-62848. New York Operations Office, NYO-10493. [348]p. plus 20 drawings

A study was performed from Oct. 15 to Dec. 15, 1962 to re-evaluate the PM-3B nuclear power plant design and to develop a revised conceptual design for application at Byrd Station. A review and analysis of the technical provisions of Contract AT(30-1)-2900 has been performed and results of this work have been submitted in a separate document. Listings of PM-3B specifications, reports, and drawings prepared under the contract are attached.

G-12097
Garshenin, V.F.
SANITARY AND HYGIENIC FEATURES OF ALUMINUM PANEL BUILDINGS AT MOLODEZHNAYA STATION. Sanitarno-gigienicheskaia kharakteristika zdanii iz aliuminievykh panelei na stantsii Molodezhnoi. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.227-230, In Russian. 5 refs.
G600.L4

Air, floor and wall temperatures, humidity, thermal insulating properties, and the like, were measured at Molodezhnaya Station during the 13th Soviet Antarctic Expedition to determine the microclimate of the buildings. Comparative data on the thermal regime in aluminum and "arbolite" dwellings favored the aluminum buildings, the microclimate of which meets sanitary requirements in the extreme conditions of the Antarctic.

G-12098
Makarov, N.I.
COMPARATIVE CHARACTERISTICS OF THE MAIN TYPES OF CLIMATIC CLOTHING OF THE VOSTOK PERSONNEL. Sravnitel'naia kharakteristika osnovnykh vidov klimaticheskoi odezhdy poliarnikov stantsii Vostok. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.231-235, In Russian. 15 refs.
G600.L4

Three sets of climatic clothing ("KAE" camel's hair suit, "KAE" downy-cotton suit and fur-leather suit) were subjected to 30 tests on men at Vostok Station during different weather conditions with the Siple wind-cooling index from 2060.9 to 3238.9 kcal/sq. m x hr. The insulating properties of the clothing were evaluated by determining the average heat flux density, cardiovascular functions and the thermal state of polar explorers. The results show that the camel's hair suit is the best for the severe weather of Vostok Station, while the fur-leather suit is not suitable even for relatively mild weather.

G-12151
MEN DRIFT FOR FIVE DAYS ON ICE FLOES IN MCMURDO SOUND. Antarctic, Dec. 1972 6(8), p.264-265

Four men from the University of Canterbury marine biology unit at Cape Bird -- an American, two New Zealanders, and an Englishman -- drifted for five days on ice floes in McMurdo Sound when their trimaran was swept into pack ice and had to be abandoned. Small supplies of food were salvaged which were rationed and eaten with sugar-flavored snow. When their food ran low, the men ate raw penguin flesh. When picked up from a small ice floe by a U.S. Navy helicopter after an aerial search by British and American aircraft for nearly 30 hr, the men were suffering from minor frostbite and snowblindness. The loss of the trimaran has stopped this season's research program.

G-12153
ROYAL AIR FORCE HERCULES FLIGHTS TO U.S. STATION. Antarctic, Dec. 1972 6(8), p.269

British and New Zealand aircraft have been assisting in the U.S. support program in the Antarctic in 1972. Two Royal Air Force Hercules aircraft took part in the summer Antarctic airlift with Military Airlift Command Starlifters and Hercules aircraft of the Royal New Zealand Air Force to transport urgently needed cargo from Christchurch to McMurdo Station. The R.N.Z.A.F. completed ten return flights between Christchurch and the R.A.F. detachment made 20. Most of the cargo was needed for construction work at Siple and South Pole Stations. Two R.N.Z.A.F. helicopter pilots, the first to fly helicopters in the Antarctic, are spending 2 mo in the summer 1972-73 on helicopter operations with the U.S. Navy's support force.

G-12156
HALLETT STATION TO BE CLOSED. Antarctic, Dec. 1972 6(8), p.273

Hallett Station, one of the original International Geophysical Year stations, which was operated jointly by the U.S. and New Zealand from 1957 to 1965, will be closed at the end of the 1972-73 summer. On Mar. 6, 1964, a fire completely destroyed the main scientific building and the equipment operated by three New Zealanders throughout each year. Since then the station has been occupied by American scientists in the summer months, chiefly for biological research. It has also functioned as a communications and weather reporting station on the air route between Christchurch and McMurdo Station and as an alternate landing field when Williams Field in McMurdo Sound was closed. Noteworthy events in the station's 8 yr history are briefly discussed.

G-12196
Hoffman, C.R.
TUNNEL VENTILATION AND HEAT CONTROL IN UNDERSNOW CAMPS--BYRD STATION, ANTARCTICA. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical report, Feb. 1973 R-783, 38p., AD-757 675, 7 refs.

Antarctic stations located in tunnels beneath the snow surface, such as the South Pole Station and the recently closed Byrd Station, are of limited useful life because of snow deformation in the tunnel walls and roof. This deformation accelerates as snow temperature increases, which makes the control of heat gain very important. Studies of temperature control methods in snow tunnels were conducted at Byrd Station from December 1965 to October 1971 and demonstrated that the use of large-diameter

gravity ventilation ducts from the tunnel to the surface is an effective method for venting unwanted heat when surface air temperatures are lower than the desired tunnel temperature. When surface air temperatures are too warm, large volumes of supplemental cooling air can be obtained from specially constructed systems utilizing the heat sink represented by the surrounding snowfield. Byrd Station tunnel temperatures are evaluated during the use of different ventilating methods. Design considerations are presented for construction of the supplemental cooling system and for fabrication of ventilator caps found effective in preventing the ingestion of windborne surface snow.

G-12202
Lindsay, J.F.
REVERSING BARCHAN DUNES IN LOWER VICTORIA VALLEY, ANTARCTICA. Geological Society of America. Bulletin, May 1973 84(5), p.1799-1806, 13 refs.

Approximately 30 reversing barchan dunes occur along the northern side of lower Victoria Valley, Antarctica. Laminae which dip steeply upwind suggest that much of the internal structure of the dunes develops during periods when the wind reverses itself - possibly during winter. This wind reversal and the fact that the dune cores are frozen suggest that the migration of the dunes is small. Grain-size analyses of the dune sands indicate that the dunes are similar in texture to some barchans of more temperate climates. (Auth.)

G-12222
Tyler, P.E.
SANITATION AND WASTE DISPOSAL IN ANTARCTICA. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.241-246, 4 refs.

The problems of sanitation and waste disposal in Antarctica are discussed. Pollution can be described as the artificial alteration of the environment by man which appears to have adverse affects upon the environment. Man's ability to alter and/or pollute his environment has increased with advances in technology. As the level of sophisticated support increases, so does the level of actual and potential pollution due to the introduction of more man-made materials. The new sewage treatment plant, compactor for noncombustibles, and incinerator which was constructed in 1971 at McMurdo will convert refuse to a more acceptable form, but they will not alter the basic problem of disposal. More energy and materials which are potentially polluting will be required to build the facilities and more people will be needed to run them who in turn will produce more waste products requiring disposal. Future plans for bases in the Antarctic should include restrictions on the number of station personnel, the introduction of excess materials, and the use of aircraft and ground vehicles.

G-12223
Risebrough, R.W. , McLaughlin, D.J.
PROPOSAL FOR THE CONSTRUCTION OF A MODEL ANTARCTIC BASE. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.247-256

Plans are proposed for a new model base to replace Hallett Station which would be compatible with man's long term existence in the Antarctic and with local ecosystems. The disposal of waste products is of primary importance. Plastic bags for the disposal of organic wastes have been convenient to use but unacceptable because of their persistence in the environment, and open burning releases pollutants into the atmosphere. It is therefore necessary that the organic wastes of both kitchen and toilets be reduced to CO_2, water, and salts before they are returned to the environment. An incinerator could accomplish part of this task, after which the ashes and other solid waste might be compacted to blocks for back loading, disposal at sea, or local landfills that could extend the area available for penguin rookeries. The plans include an overhead monorail system with an electrically operated chain hoist, which could move containers from one part of the station to another or cargo between the pier and the station. The use of thermal glass and plastic sandwich panels for living quarters would provide a view, compactness, and privacy. Other features of the design are briefly discussed.

G-12230
Stuart, G.F. , Sites, M.J.
RADIO NOISE SURVEY OF THE MCMURDO AREA. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.1-5, 5 refs.

Radio noise levels were measured during Nov. 1970 at 19 sites within 100 km of McMurdo. As expected, the highest noise levels were recorded in the immediate vicinity of McMurdo and Scott Stations, decreasing rapidly away from these centers. Power lines appear to be major contributors. The noise around these stations was impulsive, with occasional high amplitude bursts (probably from operation of welders or machine tools). The quietest areas were Marble Point, Black I., and the areas north of Second Crater. The difference between the quietest and the noisiest sites was often greater than 30 decibels. Vanda Station was found to have a high inherent noise level, possibly associated with electrification of dust blown along the valley during high winds. The survey was successful in locating quiet areas where sensitive experiments may be operated, but it also indicated a need for more work to explain inherent noise characteristics at these sites.

G-12235
Smith, P.M. , Dana, J.B.
AIRBUS: AN INTERNATIONAL AIR TRANSPORTATION SYSTEM FOR ANTARCTICA. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.16-19, 2 refs.

Objectives of the airbus system are to ease research by (1) providing intercontinental and intracontinental access to all parts of Antarctica throughout the austral summer for scientists and technical experts from all nations, (2) providing intercontinental transportation during the austral winter to selected locations on the continent, and (3) enhancing cooperation among nations signatory to the Antarctic Treaty. This article discusses these objectives, reviews the advantages of such a network for scientific research, and discusses international pooling and scheduling of national logistics resources to achieve the airbus system objectives.

See also:
A-10078,A-10458,A-10640,A-10842,

A-11151,A-11166,A-11199,A-11440,A-11611,
A-11872,A-11874,A-11940,A-12023,A-12130,
A-12161,A-12194,A-12236,B-10841,B-11265,
B-11268,B-11779,B-12128,D-10108,D-10449,
D-10620,D-10628,D-10753,D-10754,D-10755,
D-10760,D-10761,D-10789,D-10816,D-10817,
D-10859,D-11418,D-11419,D-11731,D-11782,
D-12165,E-10869,F-10916,F-11013,F-11031,
F-11336,F-11800,F-11995,F-12011,F-12138,
H-11183,H-11733,H-12099,I-10857,I-12279,
J-11165,J-11856,J-12159,K-10174,K-10628,
K-10652,K-10729,K-10743,K-10792,K-11032,
L-11962

H. MEDICAL SCIENCES

H-10116
Shurley, J.T.
DREAMS GOOD AND BAD. Nutrition today, Spring 1970 5(3), p.30-31

A psychiatrist comments on two aspects of Sir Raymond Priestley's Inexpressible Island (A-10114): the role of dreams in the survival of Capt. Scott's Northern Party, and how they managed to survive. It is suggested that the dreams served the wish-fulfilling role, as postulated by Sigmund Freud, and helped maintain hope and optimism when there was almost nothing else to sustain either. In addition to self discipline and an optimistic belief in their own capacity for survival, the men were young, healthy, experienced individuals who had been conditioned by a successful year in the field and thus were psychologically better prepared than most. They also recognized clearly defined limits of responsibility and authority, were able to mobilize their total resources to combat the malnutrition and starvation, and shared a "perfect comradeship."

H-10194
Ventsenostsev, B.B.
CHANGES IN THE BLOOD OF POLAR WORKERS IN THE ANTARCTIC. K voprosu ob izmeneniiakh krovi u poliarnikov v Antarktide. Klinicheskaia meditsina, 1971 No.6, p.40-44, In Russian with English summary. 13 refs.

DNLM, W1 K1187

Changes in the peripheral blood of 43 members of the 11th Soviet Antarctic Expedition at Molodezhnaya Station during acclimatization were studied to reveal human adaptive reactions to the extremely cold conditions and to explain diseases which occur in the Antarctic. The results show that the morphological composition of the peripheral blood does not change markedly, but undergoes regular changes which are maximal during the severest winter months. At the end of the winter the blood indices revert to the initial level. The influence of natural, geographic, and social factors on hematopoiesis is considered.

H-10230
Okubo, Y. , Kobayashi, A.
MEDICAL REPORT ON THE MEMBERS OF THE JARE SOUTH POLE TRAVERSE 1968-69. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.188-203, 23 refs.

During JARE 1968-69, the inland survey expedition to the South Pole (end of Sept. 1968 to the middle of Feb. 1969) which covered a distance of 5182 km in 141 days, the physiological acclimatization of the all Japanese personnel to cold was observed. Results are reported and compared with findings obtained at Showa Station and during the JARE 1967-68 expedition.

H-10234
Kobayashi, A.
BEHAVIOR REPORT. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.273-279

Constructive criticism and matter-of-fact discussion are give of the eating, sleeping, excretion, resting, and behavior of the members of the JARE South Pole Traverse during the 5-month journey. Satisfaction obtained in these commonplace physiological functions was the most pleasant experience during the traverse. Good spirits and activity in cooperative work tended to give a sense of well-being, in retrospect.

H-10361
Strange, R.E. , Youngman, S.A.
EMOTIONAL ASPECTS OF WINTERING OVER. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.255-257, 8 refs.

A current Navy Medical Dept. project reassesses previous studies on the psychosocial characteristics of isolated antarctic groups to obtain data for use in improving methods of psychiatric screening. Three basic stresses to which members of wintering parties must adjust are identified: the isolated group, the sameness of the environment, and the absence of customary sources of satisfaction and gratification. The discussion relates to means of adjustment, psychiatric symptoms, group formation and interaction, leadership, and human adaptability.

H-10461
Seymour, G.E.
CONCURRENT VALIDITY OF UNOBTRUSIVE MEASURES OF CONFLICT IN SMALL ISOLATED GROUPS. Journal of clinical psychology, Oct. 1971 27(4), U.S. Navy Medical Neuropsychiatric Research Unit. Report 71-16, p.431-435, 5 refs.

RC321.J74

Six unobtrusive measures of group behavior (type of response to a conflict criterion item) and response or lack thereof to a sociometric questionnaire were correlated with three criteria that reflected a concurrent validation procedure. Results supported the general hypothesis that the unobtrusive measures used were indicative of conflict in small isolated groups. An unexpected finding indicated that response to stress or conflict may be characterized by apparently opposite types of behavior within groups - either withholding information or making strong negative statements about another.

H-10606
Galmarini, C.M. , Varela de Rodriguez, J.E.
ANNUAL VARIATIONS OF THE ELIMINATION OF URINARY STEROIDS IN TEN MEN IN ANTARCTICA. Variacion anual de la eliminacion de esteroides urinarios en diez sujetos habitando zona Antartica. Buenos Aires. Instituto Antartico Argentino. Contribucion, 1970 No.97, 22p., In Spanish with English, French, German, and Italian summaries. 19 refs.

The values of urinary 17-ketosteroides and 17-hydroxycorticoides are analyzed as found in 10 healthy subjects who were living on the Antarctic Continent during one year. A significant and coincident variation of the eliminated 17-

ketosteroides was found in the group under study, whereas no similar variation could be shown in the 17-hydroxycorticoides. (Auth.)

H-10747
ANTARCTIC MEDICINE. Nature, May 1972 237(5349) p.1, 2

A new institute of medical research and practice has been established at the Molodeznaya observatory - the "capital city" of Soviet Antarctic research, to study the problems of polar medicine. The work will be undertaken in the Antarctic rather than in the Arctic, in part due to the more severe conditions of the Antarctic, and in part so that the new institute can also serve as a medical treatment center for members of Soviet Antarctic expeditions. Research into acclimatization, carried out at the institute, and at other Soviet research posts in the Antarctic, will include microbiological, hygiene and pathological factors, and the incidence rate of various illnesses. The susceptibility to disease and its dependence on age, profession, polar experience, time of year, and the geographical and climatological conditions of the individual Antarctic stations will also be studied. Finally, an investigation into psychosomatic factors is planned, including a study of the nervous system under various conditions, the efficiency of the sensory organs, and psychological compatibility within the small community of a research station.

H-10785
Gunderson, E.K.E. , Ryman, D.H.
CONVERGENT AND DISCRIMINANT VALIDITIES OF PERFORMANCE EVALUATIONS IN EXTREMELY ISOLATED GROUPS. Personnel psychology, 1971 24(4), p.715-724, 6 refs.

Reliabilities and convergent and discriminant validities were determined for three performance factors, emotional stability, task motivation, and social compatibility. Subjects were 270 Navy men and civilian scientists who wintered at Antarctic scientific stations. The study replicated an earlier similar analysis and represented a continuing effort to develop viable criterion measures for an unusual and stressful environment. Interrater reliabilities for supervisor ratings tended to be low at early winter and high at late winter administrations. Split-half reliabilities for late winter sociometric evaluations were very high. Supervisor-peer agreement was high for the emotion and task criteria. Interrater reliability and validity were least satisfactory for the social criterion.

H-10858
Poggenpol', V.S. , Il'in, E.A.
HEALTH STATUS OF POLAR EXPLORERS AT VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.614-617. Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862

Monthly dispensary examinations were given to 16 men during the 13th Soviet Antarctic Expedition at Vostok Station where low partial oxygen pressure, low ambient temperature, different daylight periodicity, and frequent and fairly strong geomagnetic field variations were present. The examinations were performed in different seasons: 1) before arriving at Vostok Station; 2) in January; 3) in April; 4) in June; and 5) in Aug.-Sept. Data on subjective complaints, anthropometric indices, cardiovascular systems, and number of recorded diseases are tabulated. No relationship was established between subjective complaints and variations in meteorological conditions. The wintering party suffered from bleeding cracks on hands, lips, and nasal mucosa due to extremely low humidity in the station buildings. The examinations show no serious health disturbances and the good adaptability of the human organism to unusual environmental conditions.

H-10903
Senin, E.V.
RADIATION STRESS ON MAN AT MIRNYY AND VOSTOK STATIONS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.417-419, Translated from its Informatsionnyi biulleten' No.75, 1969. 4 refs.
Q115.S6862

Observations on the neutron and hard components and on the total flux of charged cosmic-ray particles were made daily during the 12th Soviet Antarctic Expedition from Jan. to Dec. 1967 at Mirnyy and Vostok Stations. The total annual dose of ionizing radiation received by man, computed from the cosmic-ray intensity data, is 101 mrem/yr at Mirnyy and 645 mrem/yr at Vostok Station. The radiation dose received by man from the cosmic-ray flux may vary within certain limits on the surface of the earth depending on the intensity and spectrum of radiation. The cosmic radiation intensity and spectrum in turn depend strongly on the geographic, geophysical, and meteorological conditions of a region. Therefore, the radiation dose at Vostok Station exceeds that at sea level at middle latitudes by a factor of more than 7. But in some regions of the Earth the dose of natural radiation reaches several thousand mrem/year. Nevertheless, even such high doses will probably not cause changes in the human organism.

H-10977
Beriapa, N.R. , Shastin, I.V., Barashkov, G.A.
SOME ASPECTS OF MEDICAL SERVICES IN ANTARCTIC EXPEDITIONS. Antarctic (Antarktika), 1971, p.193-205, TT 67-59071. Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 28 refs.

The special problems of acclimatization to Antarctic conditions, as indicated by the literature and the authors' own observations, are summarized and a number of preventive measures are proposed. Considering the climatic rigors and the difficulties involved in providing medical assistance, great care in selecting personnel is advised. Men with chronic health problems which may require special treatment, those who have been weakened by recent illness, those who exhibit nervous instability or an inclination toward disagreeableness and general dissatisfaction, should be excluded. Lower age limits should be set for oversnow traverses because difficulty in physical and psychological adaptation increases with age. Subjective disturbances and psychoneurological reactions are frequent, especially in the Antarctic interior; therefore psychological screening of prospective personnel is important. Preliminary conditioning to temperature and atmospheric changes should be administered, and persons failing to adapt should be eliminated. The expedition doctor must be well qualified not only in various medical and medical-research capacities, but also in the supervision of the men's exercise and rest, weight, and sanitary conditions. For Russian original see H-4548.

H-10978
Shastin, I.V.
SOVIET MEDICAL RESEARCH IN ANTARCTICA. Antarctic (Antarktika), 1971, p.206-212, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 15 refs.

The acclimatization tests given and results obtained by staff doctors of the 1st through 6th Soviet Antarctic expeditions are summarized. On the 1st expedition which wintered at Mirnyy, N.R. Paleev recorded blood pressure, body temperature, dermal electric potential, and oxygen saturation level in the blood. He observed neurasthenic symptoms, lowered blood pressure, and the dyspnea and tachycardia caused by minor exertion. He hypothesized three stages in acclimatization to Antarctic conditions: the first is characterized by functional nervous disorders and hypotonicity of the autonomic nervous system; in the second stage there is less stress on the thermoregulatory system; during the third, a stable equilibrium is established between heat production and loss. During the 5th expedition, I.V. Shastin found that disorders of the internal organs were rare, but muscular, vascular, and cardiac changes and neurotic disorders were frequent during the first half of wintering and infrequent thereafter. Lowered blood pressure and symptons of mountain sickness were found to be prevalent at Pionerskaya during the 1st expedition, and also among personnel flown into Vostok in the 3rd expedition. From studies made at Vostok, I.I. Tikhomirov established that in all personnel there was a decrease in partial pressure of O2 and CO2 in alveolar air. Despite hypocapnia, pulmonary ventilation remained high over the entire winter. For Russian original see H-4549.

H-10994
Barbashova, Z.I.
HUMAN ADAPTATION AS A BIOLOGICAL PROBLEM. SOME RESULTS OF INVESTIGATIONS. Adaptatsiia cheloveka kak biologicheskaia problema. Nekotorye rezul'taty issledovanii. Akademiia nauk SSSR. Vestnik, Feb. 1972 No.2, p.40-47, In Russian. AS262.A627

An account is given of the work of the special section on "Human adaptation" of the International Biological Program (IBP), in which scientists from more than 40 countries are participating. Studies of acclimatization of the human organism to different climates, including the Antarctic, show that functional discomfort occurring in extremely cold conditions is due to abnormal living conditions, inadequate nutrition and homesickness rather than to the cold environment.

H-11040
Doll, R.E. , Gunderson, E.K.E.
GROUP SIZE AND LEISURE ACTIVITY BEHAVIOR AMONG ANTARCTIC VOLUNTEERS. U.S. Navy Medical Neuropsychiatric Research Unit, San Diego, California. Report, Feb. 1970 No. NMNRU-70-20, 14p., AD-740 348

Questionnaires indicating amount of time spent in each of 20 leisure activities were administered on two occasions, early winter and late winter, to 171 Navy enlisted men and 103 civilian scientists who were assigned to Antarctic stations for one year. Station sizes ranged from 8 to 30 members, and groups were divided into two categories by size. The most striking finding was the relatively low level of leisure activities at the smaller stations. It appeared that larger stations afforded more recreational facilities and also more opportunities for social interactions.

H-11041
Gunderson, E.K.E.
SMALL GROUP STRUCTURE AND PERFORMANCE IN EXTREME ENVIRONMENTS. U.S. Navy Medical Neuropsychiatric Research Unit, San Diego, California. Report, 1966 No. NMNRU-66-3, 9p., AD-740 349

Studies of small groups of scientists and U.S. Navy personnel isolated at Antarctic scientific stations have indicated that emotional and motivational changes frequently occur during the long winter. Furthermore, some deterioration in group cooperation and accomplishment consistently appears. Prolonged confinement, space limitations, reductions of work load for some members, absence of usual outlets for emotional tensions, and social-cultural differences appear to be sources of stress. A number of personality measures have been shown to relate to adjustment in this restricted environment. Work role appears to be an important factor in determining organizational structure, social relationships, and performance effectiveness. Changes in task demands may profoundly effect the individual's own perceptions of his usefulness, his motivation, and the group's esteem for him.

H-11047
Varela de Rodriguez, J.E. , Toranzos, F.I., Bernaldez, J.P., Galmarini, C.M., Ursini, A., Gibone, R., Roche, J.C., Mendez, O., Markez, F.
STUDY OF THE ELIMINATION OF URINARY 17-KETOSTEROIDS AND 17-HYDROXYCORTICOSTEROIDS FOR FOUR YEARS IN MEN LIVING AT ALMIRANTE BROWN SCIENTIFIC STATION (ANTARCTICA). Estudio de la eliminacion [illegible] 17-cetosteroides y 17-hidroxicor[illegible]teroides urinarios a traves de 4 anos en hom[illegible]que vivieron en la estacion cientifica "Almirante Brown" (Antartida. Buenos Aires. Instituto Antartico Argentino. Contribucion, 1971 No.133, 34p., In Spanish with English, French, German and Italian summaries. 25 refs.

Serial determinations, 1120 of 17-ketosteroids and 460 of 17-hydroxycorticosteroids, were carried out on 36 men in yearly groups of 10, and over 4 yr, at Brown Station, West Antarctica. It was shown that the geographical and geophysical conditions do not affect the annual mean elimination of both steroids and that cold light seems to influence the variability of 17-ketosteroids but not that of 17-hydroxycorticosteroids. It is concluded that each man has a characteristic mean elimination influenced by age, weight and height, when age is between 22 and 50 yr and weight ranges from 60 to 115 kg. as in the group under study.

H-11172
Garcia, G.
DOCTOR IN THE ANTARCTIC. El medico en la Antartida. Antartida, Dec. 1971 No.1, p.54-55, In Spanish.

The article suggests that despite the advantages of experimental cold chambers, research on the effects of the conditions inherent in Antarctica on man should be carried out in situ. The changes in man's resistance to cold, hygenic conditions, and problems of medical treatment are examined briefly.

H-11183
Loots, J.M. , Kruger, M.
STUDIES ON CLOTHING AND THERMAL COMFORT IN ANTARCTICA. South African journal of antarctic research, 1971 No.1, p.11-15, 10 refs.

The general attitude of the 8th South African National Antarctic Expedition both to environment and the clothing worn, was studied by means of a questionnaire. Although indoors the men felt comfortable at temperatures ranging from 3-16 deg C, they could detect changes in temperature of 2 deg C. At higher temperatures some of the men felt too hot. The preferred indoor temperature was 13.4 deg C. The outdoor studies showed that as the men became more experienced they learned how to be as comfortable as possible; for instance, they dressed more suitably for the conditions to which they were exposed in the second half of the year than during the first few months at the base. Comparisons were made between the amount of clothing worn and thermal comfort, both indoors and outdoors, and in the periods before and after midwinter. The results indicate that there was a certain measure of acclimatization to cold.

H-11212
Loots, J.M. , Van der Merwe, A.R., Kruger, M.
CHANGES IN THE BODY-WEIGHTS AND SUBSCAPULAR SKINFOLD THICKNESSES OF MEMBERS OF AN ANTARCTIC EXPEDITION. South African medical journal, Dec. 20, 1969 54(50), p.1532-1534, 5 refs.
R98.S63

The body-weights and subscapular skinfold thicknesses of 12 members of the 8th South African National Antarctic Expedition were recorded regularly once every mo for 11 mo during 1967. A sharp increase in body-weight was observed during the first 5 mo at the base. The subscapular skinfold thicknesses, however, decreased during the first 3 mo in the Antarctic, which indicated that, although the apparent food intake was high, it was not excessive. The increase in body-weight during these 3 mo was ascribed to an increase in musculature. During the following 2 mo the skinfold thicknesses started to increase, indicating a more pronounced positive calorie balance. During the second half of the year the skinfold thicknesses increased while the body-weights remained approximately at the level attained in July. This phenomenon indicated a relative loss of muscle mass and a proportionate increase in body fat. This can be ascribed to the fact that the calorie intake was excessive in relation to calorie expenditure. However, the increase in the deposition of subcutaneous fat could also have been augmented as a result of an adaptive mechanism providing protection against cold.

H-11260
Holmes, M.J. , Allen, T.R., Bradburne, A.F., Stott, E.J.
STUDIES OF RESPIRATORY VIRUSES IN PERSONNEL AT AN ANTARCTIC BASE. Journal of hygiene, 1971 Vol.69, p.187-199, 22 refs.
RA421.J88

Thirteen men wintering on an Antarctic base were isolated from other human contact for 10 mo. During this period Coxsackievirus A21 and later influenza A2 virus were administered to some of the men. Serum samples were collected from each of the men at monthly intervals. Coxsackievirus A21 produced symptoms and apparently spread to uninoculated men. It also appears that repeated re-infections occurred and that the virus persisted in this small community for most of the period of isolation. HI antibody responses in the absence of neutralizing antibody responses seem to be transient. The vaccine strain of influenza virus induced antibody responses but did not cause symptoms. There was no evidence of spread to uninoculated men. Antibody titres against influenza C, parainfluenzaviruses 1 and 2 and coronavirus OC43 did not fall significantly during isolation. An outbreak of respiratory illness occurred at the end of isolation and its origin was traced. No causative agent was detected.

H-11264
Fry, A.J. , Grenby, T.H.
EFFECTS OF REDUCED SUCROSE INTAKE ON THE FORMATION AND COMPOSITION OF DENTAL PLAQUE IN A GROUP OF MEN IN THE ANTARCTIC. Archives of oral biology, May 1972 17(5), p.873-882, 32 refs.
RK1.A6989

Sucrose was omitted from the diet of a group of 19 men over a period of 14 weeks, and replaced by glucose syrup and cyclamate. Dental plaque was assessed fortnightly, and samples were taken for analysis. The subjects refrained from any oral hygiene procedures for 3 days before each examination. The extent of plaque rose to a peak at 6-10 weeks, then fell, until by 14 weeks it had declined to a significantly lower level than on the normal sucrose-containing diet. Compared with the normal diet, the low-sucrose diet produced plaque containing significantly more soluble carbohydrates, but there was no significant difference in total insoluble carbohydrate, or in soluble "levan". Levels of soluble calcium in the plaque were similar on both regimes, but the low-sucrose plaque contained significantly more phosphorus than the normal plaque.

H-11327
Tashpulatov, R.IU.
MICROBIOLOGICAL AND IMMUNOLOGICAL STUDIES OF THE HUMAN BODY IN ANTARCTICA, PT.1.
Mikrobiologicheskie i immunologicheskie issledovaniia cheloveka v usloviiakh Antarktidy. Soobshchenie I.. Zhurnal mikrobiologii, epidemiologii i immunobiologii, Nov. 1969 46(11), p.141, In Russian.

Non-specific human resistance and microflora in the upper respiratory tract, skin, and intestins were studied in 14 explorers before leaving for the Antarctic and at Novolazarevskaya Station during 10 months in 1967. Special attention was paid to the behavior of Staphylococcus, Streptococcus and Bacterium coli. At the end of wintering, the microflora in the nose had decreased to 1/4 and in the mouth to 1/21 of the initial number, while the quantity of hemolytic forms of microbes in the upper respiratory tract had increased. The rate of B. coli increased during polar nights and days, and decreased during regular days and nights. It is concluded that decreased resistance in the explorers was associated with an increase in the number of the hemolytic microbes in the body, and appearance of B. coli in the mouth, and proteus in the nose and on the skin.

H-11328
Tashpulatov, R.IU. , Mordvinova, N.B., Pogunova, K.A.
MICROBIOLOGICAL AND IMMUNOLOGICAL STUDIES OF THE HUMAN BODY IN ANTARCTICA, PT.2.
Mikrobiologicheskie i immunologicheskie issledovaniia organizma cheloveka v usloviiakh Antarktiki. Soobshchenie II.. Zhurnal mikrobiologii, epidemiologii i immunobiologii, April 1971 48(4), p.68-73, In Russian with

English summary.

The incidence of carrier state of pathogenic staphylococci in persons working in Antarctic conditions is as great as in other climatic conditions. No significant differences were found between the properties of staphylococci isolated in persons working in the Antarctic region and in apparently healthy persons in Moscow. Nonpathogenic staphylococci were eliminated from the upper respiratory tract of persons working in the microbe-free medium of the Antarctic in an isolated collective body. (Auth.)

H-11329
Tashpulatov, R.IU. , Rodina, R.I., Ionin, A.I., Ponomareva, N.G.
MICROBIOLOGICAL AND IMMUNOLOGICAL STUDIES OF THE HUMAN BODY IN ANTARCTICA, PT.3.
Mikrobiologicheskie i immunologicheskie issledovaniia organizma cheloveka v usloviiakh Antarktidy. Soobshchenie III.. Zhurnal mikrobiologii, epidemiologii i immunobiologii, Sept. 1971 48(9), p.81-83, In Russian with English summary.

There was found to be a direct relationship between the blood hemoglobin content of persons in a polar expedition at the Novolazarevskaya station and solar activity. During winter erythrocyte count showed no significant changes; hypochromic anemia occurred during the polar night. Members of the expedition who were in a medium practically devoid of any microbes displayed a fall of segmentonuclear neutrophils on the background of moderate lymphocytosis and eosinophilia. It is supposed that a fall of neutrophils can serve as one of the factors of reduction of nonspecific body resistance. (Auth.)

H-11347
Kikkawa, M.
MEDICAL INVESTIGATIONS ON THE WINTERING MEMBERS OF THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. I. CIRCULATORY CONDITION OF FINGER TIP IN ANTARCTICA. Antarctic record, March 1972 No.43, p.31-40, In Japanese with English summary. 6 refs.

Circulatory condition and function of the fingers of the wintering members of the 10th Japanese Antarctic Research Expedition were studied at Showa Station during the year 1969-1970. Twenty-nine persons of average age 30.9 years were examined. Outdoor temperatures at Showa Station were 0 to approx -5C in summer, and -23C in winter. The average fingertip temperature of the members was 31.3C in summer, 29.8C in winter, and 30.4C during the year, paralleling the outdoor temperature. It was found that the fingertip temperature in Antarctica was about 4C lower than that in Japan. Plethysmographs of the fingertips show a low monophasic wave (3.3 mm high), and a flattened wave when the fingertip temperature was below 25C. Generally a high dicrotic wave (12.9 mm high) was found in Japan. Pinch and adduction power of the thumb were not affected by low temperature of the fingertip. It was concluded that in Antarctica circulatory condition in the fingertip was largely affected, but function of the finger was not affected.

H-11424
POLAR MEDICINE STUDY AT MOLODEZHNAYA STATION. Antarctic, June 1972 6(6), p.205-206
G845.A55

An Institute of Polar Medicine will be established at Molodezhnaya, the main Soviet research center in Antarctica. It will be housed in a 20-room glass and aluminum building, and staffed by 15 specialists in medicine and biology. Equipment will include three computers. Studies will include microbiology and hygiene, and the physical and psychological effects on human beings of cold, enforced immobility, close proximity to others, and the long polar nights and days. Other investigations will involve the response of the circulatory, respiratory, and sensory systems to extreme cold.

H-11431
Garshenin, V.F.
NUTRITION OF POLAR EXPLORERS AT SOVIET ANTARCTIC STATIONS. O pitanii poliarnikov na sovetskikh antarkticheskikh stantsiiakh. Voprosy pitaniia, Sept.-Oct. 1971 30(5), p.32-35, In Russian with English summary. 9 refs.
QP141.A1V6

Several practical inferences were drawn concerning the nutrition of polar explorers as a result of studies carried out in the Antarctic under severe conditions. The suggestions to add vitamins and minerals to food proved worthwhile in raising the completeness and standard of the Antarctic diet.

H-11439
Antinucci, A.
ANTARCTIC MEDICINE. Correo del pinguino, Oct. 1970 1(2), p.16-17, In English and Spanish.

Control checks were made on 26 men who had been at Ellsworth Station for 2 years (1959-1960). Hypotension was registered clinically but no symptoms were noticed; pulse averaged around 65 and often went as low as 55; perhaps due to the tranquil environment; tachycardia was inversely related to temperature; recovery from exertion was slow; respiration during rest was 12-13 breaths/min.; basal metabolism dropped during the first year and was not recorded again.

H-11444
SURVIVAL IN ANTARCTICA. Supervivencia en la Antartida. Buenos Aires. Instituto Antartico Argentino. Boletin, May 1966 2(19), p.8-11, In Spanish.

Problems in human survival in Antarctica are reviewed with emphasis on carbon monoxide poisoning, frostbite, cleanliness, diarrhea, snow-blindness, sunburn, altitude sickness, shock, and hemorrhage. Symptoms, prophylaxis, and treatment procedures for the above problems and certain injuries such as cranial fractures are briefly described.

H-11460
Garshenin, V.F.
HYGIENIC STUDIES AT SOVIET ANTARCTIC STATIONS. O gigienicheskikh issledovaniiakh na sovetskikh antarkticheskikh stantsiiakh. Antarktika; doklady komissii, 1969, pub. 1971, p.171-180, In Russian. 12 refs.
G576.A65

The studies of Soviet and non-Soviet expeditions have proved the possibility of constructing new stations equipped with all necessities for normal human life and increased scientific work in the Antarctic. The use of the latest achievements to meet hygienic requirements (building design, food, clothing and social hygiene) and the carrying out of preventive measures (moderation of mountain sickness, and vitaminization and mineralization of food) will decrease the effects of unpleasant meteorological

factors and help in quicker adaptation to the extremes of the Antarctic.

H-11488
EFFECTS ON MAN. Nature, Nov. 3, 1972 240(5375), p.12-13
Q1.N2
The first symposium on human biology and medicine in the Antarctic was held at the Scott Polar Research Institute, Cambridge, from Sept. 19 to 21, 1972. The program included sessions on physiological and psychological aspects, microbiology, and clinical studies. The opening papers dealt with polar exploration yesterday and today, followed by one on the little known Japanese Antarctic Expedition of 1911-12. Other topics discussed in the contributions include acclimatization, nutrition, low temperature and isolation effects, light and darkness effects, selection techniques and sleep. There were a number of papers dealing with studies in Arctic regions, and at an informal discussion, ways in which Arctic-Antarctic collaboration could be developed were debated.

H-11538
Tikhomirov, I.I.
HYGIENIC FEATURES OF POLAR STATIONS IN CENTRAL ANTARCTICA. Gigienicheskaia kharakteristika zimovok TSentral'noi Antarktidy. Gigiena i sanitariia, Feb. 1969 No.2, 14-18. In Russian with English summary. 2 refs.
RA421.G5
The paper deals with the characteristics of the climate in the internal regions of Antarctica whose specific features are conditioned by natural factors of the polar region and specific traits of the alpine climate. The effect of the environment on winterers at intracontinental stations, the prevailing housing conditions, lighting and heating of dwelling premises, problems of work, everyday life and nutrition of winterers are discussed. Special attention is paid to specific conditons attending complete isolation in which members of the stations spend the greater part of the year. (Auth.)

H-11733
Orr, N.W.M.
FOOD REQUIREMENTS OF ANTARCTIC SLEDGE DOGS. Graham-Jones, O. (ed), Canine and feline nutritional requirements; proceedings of a Symposium organized by the British Small Animals Veterinary Association, London, May, 1964, Oxford, Pergamon Press, 1965, p.101-112, 27 refs.
SF95.G68 1965
Diets of dogs in the Arctic and Antarctic are described along with experiments to evaluate the nutritional requirements of Antarctic sledge dogs. The nutritional content of pemmican, nutrican, and seal is summarized, and each food is correlated with faeces and weight changes. It is concluded that the routine sledging ration of 2500 kcal/dog/day for unexercised, 90 pound huskies is insufficient. A ration of 5000 kcal may be adequate for dogs traveling long distances. Seal meat is highly recommended. Other problems, including supplementary feeding of whelping bitches, water requirements of dogs and conjunctivitis in dogs, are touched on in a discussion which follows the paper.

H-11780
Rasmussen, J.E. , Haythorn, W.W.
SELECTION AND EFFECTIVENESS CONSIDERATIONS ARISING FROM ENFORCED CONFINEMENT OF SMALL GROUPS. Manned Space Flight Meeting, 2nd, Proceedings, 19p., Unpublished manuscript. 15 refs.
Selection and effectiveness of members of small groups to be confined in isolated, sensory poor environments are considered. The psychological effects of Antarctica on US personnel stationed there from 1956 to 1963 are discussed. Three adjustment phases to prolonged Antarctic isolation are discussed: the initial period of anxiety, the long routine period lasting through the Antarctic night characterized by depression and repression of hostility, and the final anticipatory phase characterized by more open hostility, less concern with work, and decreased depression. Limited behavioral data illustrating these points is included. The personality factor in crew composition, maintenance of crew effectiveness, close space environment problems, and performance criteria are examined.

H-12033
Biriukov, E.N. , Bazhanov, V.V., Koliadenko, A.P.
FUNCTIONAL STATE OF CARDIOVASCULAR SYSTEM DURING THE ACUTE PERIOD OF ACCLIMATIZATION AT VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.171-172, Translated from its Informatsionnyi biulleten', No.81, 1970. 2 refs.
The acclimatization problems peculiar to high Antarctic elevations--hypoxia and lower temperatures--are discussed in relation to the functional state of the cardiovascular system during the first month of stay at Vostok Station in 12 men. Systolic pressure averaged 134 mm Hg on the second day (normal 121) and diastolic 88 (normal 80 mm) and pulse pressure 46 (normal 41). After 2 weeks fluctuations occurred again. Systolic pressure was dropping by the end of a month. Similar variations also occurred in pulse dynamics. Acute hypoxia is seen as the cause. During the first two weeks there were many complaints about shortness of breath, headaches, poor appetite, and poor sleep. During personnel selection load tests are recommended to detect and eliminate from wintering over personnel with a tendency toward hypertension.

H-12034
Popov, A.A. , Khomulo, P.S.
EFFECT OF SOLAR AND GEOMAGNETIC ACTIVITY AND OF ATMOSPHERIC PRESSURE ON THE SUBJECTIVE STATUS OF POLAR EXPLORERS AT MOLODEZHNAYA STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.172-173, Translated from its Informatsionnyi biulleten', No.81, 1970. 9 refs.
The average monthly magnetic disturbance (K-index), atmospheric pressure, and the total number of complaints by polar explorers at Molodezhnaya Station in 1969 are tabulated by month in an attempt to determine the degree of correlation between magnetic disturbances, atmospheric pressure, and human physiology. The major complaints (not listed separately) were arthralgia, myalgia, cardialgia, poor sleep, and cephalalgia. Increased complaints coincided with increased magnetic disturbance in 5 months. During the month having the greatest number of magnetic storms, 10 men complained of heart pain resembling stenocardia, with pain appearing directly following the storms. Significant atmospheric pressure drops also coincided with increased complaints.

H-12035
Bazhanov, V.V. , Biriukov, E.N., Koliadenko, A.P.
PHYSICAL TRAINING AS A MEANS OF SUSTAINING THE EFFICIENCY OF THE WINTERING PERSONNEL OF VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.174-175, Translated from its Informatsionnyi biulleten', No.81, 1970.

Physical training is found to be effective as a nonspecific biological stimulus to increase resistance to hypoxia, low temperature, darkness, and confined living conditions resulting in sensory deprivation. Pedaling, rowing and isometrics were used, resulting in increased efficiency, lack of deterioration of cardiovascular reaction to exercise (in contrast to the control), and level or even increased muscular strength and endurance. Details of the training cycle are included.

H-12036
Bogoslovskii, M.M.
SLEEP PATTERN OF WINTERING-OVER PERSONNEL AT MIRNY OBSERVATORY. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.176-178, Translated from its Informatsionnyi biulleten', No.81, 1970. 10 refs.

The sleep patterns of Mirnyy Observatory personnel wintering over are investigated by questioning and actography. Sleep disturbances (either initial insomnia or waking up in the middle of the night) occurred for 11 of the 64 men observed at the beginning and fell to 4 subjects by the end of the year. No marked changes occurred in dress patterns or in sleep as a result of response to light and dark periods. Statistical actographic data is given; no seasonal differences were noted. Sleep was most quiet toward the end of the year.

H-12037
Pal'ianov, O.I.
SOME RESULTS OF PHYSIOLOGICAL-HYGIENIC INVESTIGATIONS OF POLAR CLOTHING IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.178-180, Translated from its Informatsionnyi biulleten', No.81, 1970. 5 refs.

Thermal indices of personnel were measured for two sets of clothing at various low temperatures during outdoor excerise. Other tests studied wind effect on these and one other uniform. The findings apply only to Soviet Antarctic clothing.

H-12072
Matusov, A.L. ed
MEDICAL STUDIES IN ARCTIC AND ANTARCTIC EXPEDITIONS. Meditsinskie issledovaniia v arkticheskikh i antarkticheskikh ekspeditsiiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, 240p., In Russian with English table of contents. Numerous refs.
G600.L4

Acclimatization of human beings is discussed on the basis of findings in explorers in the Arctic and Antarctic. Clinical, physiological, hygienic and psychological studies during polar expeditions have provided a number of important recommendations concerning the provision and nutritive value of food and on therapeutic-prophylactic measures for minimization of the polar effect on the human organism. Functional changes of various organs in the process of acclimatization are reviewed. For abstracts of selected papers see: G-12097 and H-12073-12096, 12098-12100.

H-12073
Matusov, A.L.
MEDICAL CARE AND SANITATION FOR PERSONNEL AND MEDICAL RESEARCH IN THE ARCTIC AND ANTARCTIC. Mediko-sanitarnoe obespechenie i nauchnaia deiatel'nost' vrachei v arkticheskikh i antarkticheskikh ekspeditsiiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.10-14, In Russian.
G600.L4

The results and basic tasks in the study of human acclimatization carried out by the Polar Medical Section, organized at the Arctic and Antarctic Scientific Research Institute in 1966, are discussed. On the basis of detailed analyses of recorded diseases, sickness rate, and meteorological conditions, the Section has been able to furnish all Antarctic stations with up-to-date medical equipment and facilities.

H-12074
Matusov, A.L. , Deriapa, N.R., Riabinin, I.F., Shastin, I.V., Ventsenostsev, B.B.
HUMAN ACCLIMATIZATION AND PATHOLOGY IN ANTARCTICA. Akklimatizatsiia i patalogiia cheloveka v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.15-38, In Russian. 35 refs.
G600.L4

Data are summarized on the human acclimatization and pathology obtained during the last years in the Antarctic by Russian and non-Russian scientists. The results of observations on the nervous, cardio-vascular, respiratory, digestive, and urinary systems and blood are discussed. Diseases and sickness rate among the polar explorers related to the age and type of work were studied. Effects of the microflora, hygiene, nutrition, and social and daily conditions on human adaptation were considered. It is concluded that during Antarctic acclimatization, generally, only physiological changes occur followed by functional restoration in a short time; and diseases are light cases. Further studies in human pathology and physiology during adaptation are suggested.

H-12075
Deriapa, N.R.
CLINICAL AND PHYSIOLOGICAL CHARACTERISTICS OF PROCESSESS IN THE HUMAN BODY DURING ACCLIMATIZATION IN ANTARCTICA. Kilniko-fiziologicheskaia kharakteristika protsessa akklimatizatsii cheloveka v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.39-49, In Russian. 13 refs.
G600.L4

Data obtained by the 6th (1960-1962) and 10th (1964-1966) Soviet Antarctic Expeditions were studied to determine the clinico-physiological aspects of acclimatization in coastal and Central Antarctica. Of 160 members of the expeditions observed, 80 percent were from 23 to 39 years old, 60 percent were manual workers, and 30 percent had wintered over repeatedly. The study deals with functional changes in the organs, clinical symptons of diseases, and efficiency of preventive practices during sickness in the adaptation period. Results of the studies, which are given in detail, serve as practical advice in medical care.

H-12076
Boriskin, V.V.
FEATURES OF HOUSING AND PROVISION OF LIVING NECESSITIES AT POLAR STATIONS. Osobennosti obitaniia i zhizneobespecheniia liudei, rabotaiushchikh na poliarnykh stantsiiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.50-65, In Russian. 7 refs.
G600.L4

The objective of this paper is to present: 1) studies on living and working conditions in the Arctic and Antarctic; 2) evaluation of energy expenditure during various types of work at high latitudes, and of the calories and content of daily rations; and 3) determination of the adaptation reaction resulting from chemical and physical thermoregulation. The subjects were personnel staying in the Arctic and Antarctic for several days to 19 months. Coeval observations included, air temperature and pressure, humidity, ionization, and wind, as well as indoor climate and hygiene. Studies in the polar regions have been assuming that an increase in human basal metabolism is attributable to insufficient protection from the cold, rather than to a period of acclimatization.

H-12077
Tikhomirov, I.I.
HYGIENIC CONDITIONS DURING WINTERING PERIODS IN CENTRAL ANTARCTICA. Gigienicheskaia kharakteristika zimovok Tsentral'noi Antarktidy. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.66-77, In Russian. 25 refs.
G600.L4

Hygienic conditions were studied in Central Antarctica, typically dominated by low atmospheric temperature down to -80 C (due to high altitude and albedo), negative radiation balance, continental climate and anticyclones. Environmental cooling is increased also by continuous winds. An effect of the low air temperature and humidity on man, causing excessive supercooling of the respiratory tract, face and hands, is discussed. Suitable clothes, hygienic building conditions, adequate food storage, and proper nutrition are recommended to increase work capacity, to improve "self-feeling", and to speed up and ease the acclimatization process.

H-12078
Zabarsakin, V.A. , Shalunov, IU.G.
MEDICAL GEOGRAPHY OF THE ACCLIMATIZATION PROCESS IN PERSONNEL AT BELLINGSHAUSEN STATION. Kratkaia mediko-geograficheskaia kharakteristika techeniia akklimatizatsicnnogo protsessa u poliarnikov stantsii Bellingshauzen. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.78-82, In Russian. 4 refs.
G600.L4

Characteristics of the acclimatization process at Bellingshausen Station, West Antarctica, were studied in relationship to climatic and living conditions. A total of 11 members of the 13th Soviet Antarctic Expedition were observed, 4 over, and 7 below 40 years of age. In addition to the regular monthly check-ups, tests of the blood, urine, gastric juice and respiration were made. The results show development of some subjective disturbances, although, general health remains satisfactory. Thus, the acclimatization process is proving itself, by physiological standards.

H-12079
Bundzen, P.V.
IMPORTANT PROBLEMS OF PSYCHOPHYSIOLOGICAL STUDIES IN ANTARCTICA. Pervoocherednye zadachi psikhofiziologicheskikh issledovanii v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.83-89, In Russian. 27 refs.
G600.L4

Factors, such as relative isolation and climatic and living conditions, which affect the psychophysiological state of Antarctic explorers, are discussed. Data obtained by using Eysenek's unified quantitative psychometric test for psychophysiological variations in 96 members from different stations during the 12th Soviet Antarctic Expedition, were studied. The test evaluates the psychoneurotic status according to two orthogonal factors, extroversion-introversion and neuroticism. An analysis shows that regardless of the adverse living conditions of explorers at Antarctic stations, the degree of neuroticism increases during the wintering period, and the tendency toward introversion is observed. A gradual decrease was found to occur in the restraint mechanism controlling increased sensitivity of the central nervous system to environmental factors. Further development is recommended of psychophysiological studies, to establish a basis for the proper selection of personnel.

H-12080
Il'in, E.A.
CHANGES OF NEURO-PSYCHIATRIC STATE AND EFFECTIVENESS OF DRUGS IN ITS NORMALIZATION AT VOSTOK STATION DURING THE WINTERING PERIOD. Izmeneniia nervo-psikhiatricheskogo sostoianiia i medikamentoznye sposoby ego normalizatsii v usloviiakh zimovki na stantsii Vostok. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.90-98, In Russian. 5 refs.
G600.L4

The effectiveness of drugs in the treatment of neuroses at Vostok Station was studied in two curative and control groups of 8 men each. Several psychophysiological observations on mental activity and behavior during a 12-mo period showed that ability in the exercise of thought, memory and attention had not changed perceptibly. Some neuro- and psychotropic drugs are recommended to reduce undesirable changes.

H-12081
Boriskin, V.V.
CAUSES OF CHANGES IN WELL-BEING AND IN SOME PHYSIOLOGICAL FUNCTIONS IN MEN AT POLAR STATIONS. O prichinakh izmeneniia samochuvstviia i otdel'nykh fiziologicheskikh funktsii u liudei vo vremia raboty na poliarnykh stantsiiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.99-113, In Russian. 28 refs.
G600.L4

Data on human reaction to acclimatization were studied during the year in three groups, two in the Arctic and one in the Antarctic. No significant changes were found in the erythrocyte count in the blood and in the amount of 17-ketosteroids and oxycorticosteroids in the urine during the wintering period. Functional conditions of the central nervous system show that lightness and darkness effects play significant roles in the regime of sleep and

wakefulness. The psychic activity and mental working capacity improve with increased stay at polar stations.

H-12082
Ventsenostsev, B.B.
PSYCHOPHYSICLOGICAL STUDIES IN THE ANTARCTIC. Psikhofiziclogicheskie nabliudeniia za poliarnikami v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.120-124, In Russian. 6 refs.
G600.L4

An effect of the meteorological and living conditions on some aspects of higher nervous activity was studied on 41 explorers from 22 to 53 years of age. Data were tabulated and discussed on tests made in April, June, August and October for "adding numbers", "finding numbers", "proof-reading", "reactions to moving objects" and "memory for numbers". It is concluded that improvement of some psychic functions, better mental working capacity and analytic organ sensibility at the end of the wintering period, is considered to be a compensative and adaptive reaction of the body to the conditions of permanent sensory insufficiency.

H-12083
Bogoslovskii, M.M.
ACTOGRAPHIC STUDIES OF HUMAN SLEEP IN ANTARCTICA. Aktograficheskoe izuchenie sna cheloveka v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.125-127, In Russian. 8 refs.
G600.L4

Twenty-two persons from 28 to 44 years of age engaged in different occupations, participated in studies of sleep patterns at Mirnyy Station from Jan. 1969 to Jan. 1970. Actographic recordings were made during three 6- to 10-day periods in March-April, June-July, and November-December. The results show that during the last (polar day) period the sleep was the most restful, while during the second period the sleep was the most restless, the causes of which are still unknown. Average duration of sleep was 8 hours. The sleep-awake pattern in the Antarctic is determined by social relationships and living conditions, rather than by the light-dark factor.

H-12084
Deriapa, N.R.
COMPARATIVE ANALYSIS OF BLOOD CIRCULATION IN MEN OF TWO EXPEDITIONS IN COASTAL ANTARCTICA. Sravnigel'nyi analiz sostoianiia krovoobrashcheniia u poliarnikov dvukh ekspeditsii v usloviiakh pribrezhnoi Antarktidy. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.133-141, In Russian. 14 refs.
G600.L4

The reaction of the cardiovascular system to acclimatization was studied in 160 wintering members ranging in age from 23 to 54 years during the 6th and 10th Soviet Antarctic Expeditions at Mirnyy Station. The study included cardiac rate, systolic volume, minute blood volume, peripheral vascular resistance, mean dynamic pressure, and complex features of hemodynamics. A comparison of data obtained during the two expeditions indicates considerable variations in functioning of the circulatory system under similar environmental conditions. The causes of the unequal results are still unknown. Because of the incompleteness of the present study, further investigations on cardiovascular system are suggested.

H-12085
Tikhomirov, I.I.
CHANGES IN BIOELECTRICAL ACTIVITY OF THE HUMAN HEART AT VOSTOK STATION. O kharaktere izmeneniia bioelektricheskoi aktivnosti serdtsa u zimovshchikov stantsii Vostok. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.142-148, In Russian. 6 refs.
G600.L4

Bioelectrical activities of the myocard were studied to determine functional states of the heart during acclimatization to Antarctic conditions of 9 men at Vostok Station. Electrocardiograms recorded monthly during the year of the subjects at rest under physical stresses show that variations in the heart activity were found in all subjects and were of the same type. It was concluded that the variations indicate functional dynamics of the myocard during the acclimatization processes.

H-12086
Leonov, V.M. , Bochorishvili, V.G.
VARIATIONS IN ELECTROCARDIOGRAMS OF THE PERSONNEL OF AN ANTARCTIC EXPEDITION. Izmeneniia elektrokardiogrammy u uchastnikov antarkticheskoi ekspeditsii. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.153-159, In Russian. 8 refs.
G600.L4

A study was conducted to determine whether the cardiovascular system continues to change after complete acclimatization. Clinical and electrocardiographic data were studied in 64 persons at Mirnyy Station in February (3 months after arrival to Antarctica), June, and October 1966. In conclusion, adaptation in the cardiovascular system decreases very gradually and dinstinctly during and after acclimatization.

H-12087
Ponomarev, V.N.
CIRCULATION AND BREATHING RESPONSES DURING PHYSICAL WORK IN A POLAR CLIMATE. Reaktsiia sistem krovoobrashcheniia i dykhaniia pri vypolenii fizicheskoi nagruzki v usloviiakh poliarnogo klimata. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.160-163, In Russian.
G600.L4

Experimental studies are reported on reactions to physical work during the acclimatization period at Novolazarevksaya Station in 1962-1963, at Vostok in 1964-1965, and at "Severnyi polius-13" Station in 1966. Of 56 men between the ages of 23 and 50, 40 had wintered over before. It is concluded that adaptation of both new and veteran personnel to polar regions under physical stress develops qualitatively in a parallel manner: functions of the circulatory and respiratory systems increase. Quantitative variations in the reaction to stress are determined by environmental factors.

H-12088
Riabinin, I.F. , Pushkarev, A.D., Chireikin, L.V.
HEMODYNAMICS AND CONTRACTIVE FUNCTION OF THE

MYOCARD IN POLAR EXPLORERS AT MIRNYY STATION. Izuchenie gemodinamiki i sokratitel'noi funktsii miokarda u poliarnikov stantsii Mirnyi. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.164-171, In Russian. 4 refs.
G600.L4

Clinical and biochemical data, electrocardiograms (before and after a physical work load), tachooscillograms, pulse rate, and polycardiograms, taken in 50 men at Mirnyy Station in 1966, were studied to determine functions of the cardiovascular system during the acclimatization process. In conclusion, no significant pathological changes in the hemodynamics were found during and after the one-year stay. Changes in functions of the cardiovascular system in healthy men are adaptive reactions of the body to the cold environment.

H-12089
Kaluzhenko, P.K.
BLOOD COAGULATION IN A WINTERING-OVER CREW AT VOSTOK STATION. Svertyvaiushchaia sistema krovi u zimovshchikov na stantsii Vostok. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.172-176, In Russian.
G600.L4

Results of 23 tests for blood coagulability carried out on 16 members of the 11th Soviet Antarctic Expedition at Vostok Station were studied. Coagulograms were taken three times before the expedition, in the middle of wintering-over, and 8 months after returning to Leningrad. In summary, the subjects who had normally functioning coagulative and anticoagulative blood systems before the expedition experienced depressive functioning of coagulation, hyperfibrinolysis, intensive function of the thrombocytogenic system, and insufficient hemostatic function of the capillars in the middle of wintering-over. Eight months after the expedition the time for the blood coagulation was still prolonged, although the activity of the prothrombine and proconvertine factors was increased. The number of the thrombocytes was above normal level, but with reduced activity. Other indices of the coagulation system had normalized at that time.

H-12090
Ventsenostsev, B.B.
BLOOD SYSTEM OF THE WINTERING-OVER PERSONNEL AT MOLODEZHNAYA STATION. Sostoianie sistemy krovi u poliarnikov vo vremia zimovki na stantsii Molodezhnoi. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.177-181, In Russian. 14 refs.
G600.L4

Data on the blood picture obtained in 43 members of the 11th Soviet Antarctic Expedition before starting on the expedition and at Molodezhnaya Station in April, June, Auug., Oct., and Dec. 1966 were analyzed. The results show a decrease in erythrocyte sedimentation rate (ESR), in color index, and in contents of hemoglobin, erythrocytes and leukocytes, the lowest value of which were found in June, i.e., during the polar night. These changes relate to the light and climatic regime in Antarctica and require medical consideration, since normal blood indices for middle latitudes could be pathological in antarctic conditions.

H-12091
Poggenpol', V.S. , Il'in, E.A.
SOME CHANGES IN HUMAN OXYGEN REGIME DURING PROLONGED STAYS UNDER EXTREME CONDITIONS. Izmenenie nekotorykh storon kislorodnogo rezhima organizma cheloveka pri dlitel'nom prebyvanii v ekstremal'nykh usloviiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.182-186, In Russian. 4 refs.
G600.L4

Tests for oxygen saturation of the blood were conducted at Vostok Station from Jan. to Sept. 1968 by methods of breath holding at inspiration and expiration, hyperventilation, and dosed-out physical exercises. An analysis shows that oxyhemoglobin content decreased at a greater rate only at the beginning of wintering, from Jan. to June. This phenomenon may be due to decreased oxygen use in the tissues during prolonged stays in conditions of hypobaric hypoxia.

H-12092
Riabinin, I.F. , Korovina, O.V.
EXTERNAL BREATHING FUNCTION OF WINTERING PERSONNEL IN COASTAL ANTARCTICA. Izuchenie funktsii vneshnego dykhaniia u poliarnikov pribrezhnoi Antarktidy. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.187-195, In Russian. 14 refs.
G600.L4

Fifty healthy members of the 12th Soviet Antarctic Expedition were observed before, during and after wintering at Mirnyy Station to determine the pathogenesis of polar dyspnea and changes in the pulmonary breathing function. Complete spirographic and pneumotachometric studies showed no significant changes in ventilation indices during a one-year stay in coastal Antarctica, and revealed high adaptability of man to the cold environment.

H-12093
Podolian, L.A.
SUBJECTIVE STATES AND PHYSICAL CONDITIONS OF PERSONNEL AT MOLODEZHNAYA STATION. Sub"ektivnyi status i fizicheskoe sostoianie poliarnikov stantsii Molodezhnoi. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.196-201, In Russian. 13 refs.
G600.L4

Results of monthly check-ups of 59 members of the 12th Soviet Antarctic Expedition at Molodezhnaya Station showed a higher number of complaints during polar nights. Almost all observed men showed a tendency to gain body weight from March to Sept., but in Nov. the weight returned to normal. There was no evidence of significant changes in physical condition, and it is concluded that subjective disorders were due to functional changes in various systems of the organism during the acclimatization period.

H-12094
Ventsenostsev, B.B.
POTASSIUM AND SODIUM ELECTROLYTES IN URINARY EXCRETION OF ANTARCTIC PERSONNEL. Vydelenie elektorlitov kaliia i natriia s mochoi u poliarnikov v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.211-215, In Russian. 13 refs.
G600.L4

About 5.4 gr of potassium and 6 gr of sodium (15 gr of salt), which are the upper limit of

normal use, were taken daily by 43 members of the 11th Soviet Antarctic Expedition (ages 20 - 53) at Molodezhnaya Station. Analyses of the urine for electrolytes, performed in April, June, August, October and December, show a moderate increase in potassium and sodium in urinary excretion. The sodium/potassium ratio in the urine was normal, as indicated indirectly by no increase in corticosterone (particularly aldosterone) during the wintering period in Antarctica.

H-12095
Ventsenostsev, B.B.
URINARY EXCRETION OF VITAMINS B1 AND B2 BY ANTARCTIC EXPLORERS. Ekskretsiia s mochoi vitaminov B1 i B2 u poliarnikov v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.216-219, In Russian. 12 refs.
G600.L4

Studies of the vitamin balance in 43 members of the 11th Soviet Antarctic Expedition at Molodezhnaya Station showed a decrease in the excretion of thiamine (vitamin B1) in the urine from April to Dec. 1966. Excretion of riboflavin (vitamin B2) in the urine was normal in most explorers. Preventive vitamin-enrichment measures are recommended from the very beginning of the wintering period.

H-12096
Tashpulatov, R.IU. , Petrosov, V.V.
QUANTITATIVE VARIATIONS OF MICROFLORA IN EXPLORERS DURING THE 12TH AND 13TH SOVIET ANTARCTIC EXPEDITIONS. Izuchenie kolichestvennykh kolebanii v mikroflore cheloveka v period Dvenadtsatoi i Trinadtsatoi sovetskikh antarkticheskikh ekspeditsii. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.220-226, In Russian. 9 refs.
G600.L4

Microfloral studies in 30 members of the 12th and 13th Soviet Antarctic Expeditions (1967-1969) in different periods of wintering at Novolazarevskaya Station show that the amount of microorganisms in the upper respiratory tract, intestine and skin decreases, while the rate of hemolytic forms of microbes increases toward the end of wintering. During the second half of wintering, Bacteria coli were found in the mouth. It is likely that at this time the natural resistance of the human organism is low.

H-12099
Riabinin, I.F.
SOME PROBLEMS OF MEDICAL CARE FOR PERSONNEL DURING CONTINENTAL TRAVERSES IN ANTARCTICA. Nekotorye voprosy meditsinskogo obespecheniia vnutrikontinental'nykh pokhodov v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.236-240, In Russian. 9 refs.
G600.L4

Since a cook was included in the continental tractor-train traverse during the 12th Soviet Antarctic Expedition, the time for halts became shorter, daily schedules were implemented, three hot meals were served, and the travel lasted from 11 to 12 hr a day. Data on medical check-ups and types of complaints are discussed. Unlike in previous years, the body weight of the participants was practically unchanged. Protective measures against frostbite and mechanical injuries were taken. Nevertheless, discomfort was experienced en route due to shortcomings in sanitary conditions. It is concluded that proper preparation for the expedition, screening of personnel, and economical and medical maintenance contributed to the successful accomplishment of the intercontinental traverse.

H-12100
Ventsenostsev, B.B.
NUTRITION OF POLAR EXPLORERS IN ANTARCTICA. K voprosu o pitanii poliarnikov v Antarktide. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 Vol.299, p.202-210, In Russian. 30 refs.
G600.L4

Calorie ration, and the content of proteins, fat, carbohydrates, vitamins and minerals in the food during the 9th, 10th and 11th Soviet Antarctic Expeditions were studied. The daily ration consumed by the members of the expeditions at Molodezhnaya Station (4450 kcal) was slightly smaller than the norm set for the Far North, and was higher than that for the regions of moderate latitudes.

H-12152
STUDIES OF 'LONG EYE' AND COLDS AT POLE STATION. Antarctic, Dec. 1972 6(8), p.266-267

Studies are being conducted at Amundsen-Scott Station to determine why men living in isolation on the Antarctic Continent invariably catch colds soon after their first contact with newcomers from the outside world and to obtain information on the complaint known as "long eye" or staring. Attempts will be made to determine whether the men lose their resistance through isolation, and then to identify the virus. It is believed that altitude might have something to do with staring behavior. The 22 men who spent the winter at the South Pole this year suffered no serious health and isolation problems. Activities at the station during the winter months are briefly described.

See also:
A-10113,A-10114,B-12054,B-12224,
D-10115,G-11033,G-11223,G-11258,G-11769,
G-12097,G-12098,G-12151,H-11424

I. METEOROLOGY

I-10005
Ishida, K. , Suzuki, T., Sakai, S.
METEOROLOGICAL OBSERVATIONS AT SYOWA STATION IN 1969 BY THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. Antarctic record, Jan. 1971 No.39, p.19-31, In Japanese with English summary.

The 10th Japanese Antarctic Research Expedition included meteorological observations at Showa Station between 1 February, 1969 and 31 January, 1970. The main subjects of observations, the method, and the equipment remain almost unchanged since 1966. The data of the surface observation at 00, 06, 12, 18 GMT and the aerological observation at 00 GMT were reported to Melbourne via Mawson according to the WMO Regulations. Observations of the ground temperature at 50 cm and 90 cm deep, the amount of ozone at the surface, and the total amount of ozone, especially in winter, were also carried out. Characteristics in this season were: (1) Monthly mean temperatures till June 1-2 C higher than the normal year. (2) Annual amount of precipitation less than for the normal year. (3) Stratowarming from 27 October to 1 November, with temperature about -45 C at 50 mb (20 km) level.

I-10006
Ishida, K. , Suzuki, T., Sakai, S.
TOTAL OZONE OBSERVATIONS AT SYOWA STATION, ANTARCTICA IN 1969. Antarctic record, Jan. 1971 No.39, p.32-38, In Japanese with English summary. 2 refs.

Total ozone observations using Dobson's ozone spectrophotometer were made at Showa Station in 1969. The procedures are described, along with a newly tested focussed image method using moonlight during the dark season. The amount of total ozone is larger in summer and a noticeable change in the values of each 10-day mean is observed at about the time of the stratowarming (from September to October). The increase in the mean monthly values is related to the increase in northerly wind component in the upper-air (at 500 mb - 100 mb level), suggesting the meridional transport of ozone-rich air masses from lower latitudes.

I-10033
Lambert, G. , Le Roulley, J-C., Sanak, J.
CORRELATION BETWEEN PB-210 DEPOSITS IN THE ANTARCTIC AND GEOMAGNETIC FIELD FLUCTUATIONS. Corrélations entre le dépôt de plomb 210 dans l'Antarctique et les fluctuations du champ magnétique terrestre. Academie des Sciences, Paris. Comptes rendus hebdomadaires des seances. Serie B, Jan. 11, 1971 272(2), p.177-180

Q2.A25

Concentrations of Pb-210 were measured along a 15m deep firn core from the coastal area of Adelie Land. The measured Pb-210 values were plotted against time and compared with corresponding variations of geomagnetic activity. A remarkable correlation was found between the two physically remote parameters which leads to the conclusion that variations of Pb-210 concentration and of the geomagnetic field must be due to a common cause, namely variations in the flux of charged particles reaching the magnetosphere. It appears, therefore, that charged particles reaching the upper atmosphere substantially affect the lower atmospheric circulation, at least in Antarctic and sub-Antarctic regions, despite the weakness of their energy flux compared to the amount of solar energy.

I-10049
Gurleva, K.A. , IAkovleva, N.I.
NATURAL ORTHOGONAL FUNCTIONS OF THE PRESSURE FIELDS OVER THE SOUTHERN HEMISPHERE. Etestvennye ortogonal'nye funktsii polei davleniia nad iuzhnym polushariem. Leningrad. Glavnaia geofizicheskaia observatoriia. Trudy, 1969 No.236, p.83-90, In Russian. 11 refs.

Dispersion values and pressure fields were calculated and analyzed from natural orthogonal functions for the Southern Hemisphere during the warm and cold half-years from 1955 to 1961, for the first time. Conclusions are given on evaluations of statistical data and field observations of hemisphere climate and a comparison of pressure patterns in the Northern and Southern Hemisphere.

I-10053
Akvilonova, A.B. , Kutuza, B.G., Mitnik, L.M.
LATITUDINAL DISTRIBUTION OF THE INTEGRAL WATER CONTENT OF CLOUDS OVER THE EARTH ACCORDING TO MEASUREMENT DATA FROM THE COSMOS-243 SATELLITE. Shirotnoe raspredelenie vodnosti oblakov nad zemnym sharom po dannym izmerenii s ISZ "Kosmos-243". Akademiia nauk SSSR. Izvestiia. Fizika atmosfery i okeana, Feb. 1971 7(2), p.139-144, In Russian with English summary. Eng. transl. in: Acad. Sci. USSR. Izv., Atmos. Oceanic Phys., 7(2):97-99, July 1971. 9 refs.

The results of radiometric measurements of the water content of clouds above bodies of ocean water between 60 N and 60 S from Sept. 23 to 27, 1968 are presented. The particular features of the latitudinal distribution of the water content over the world and above the Pacific, Atlantic and Indian Oceans are discussed. Data on the cloud formations recorded by the radiometric method are compared with photographs taken by meteorological satellites and by the Zond-5 space station. The total mass of liquid water in the earth's atmosphere during the measurement period is estimated to be 8.7 x 10 exp. 16 g. A comparison is made of the latitudinal distributions of the water content of clouds and of the total moisture content of the atmosphere. Above the Antarctic region S of 60 S the cloud water content was taken to be equal to zero, since clouds are crystalline only.

I-10064
Kondo, G.
DATA OF ATMOSPHERIC ELECTRICITY AT SYOWA STATION IN 1969-1970. Japanese Antarctic Research Expedition. Data reports. Meteorology, March 1971 No.11, 74 p., 5 refs.

Data is tabulated of atmospheric electricity observations at Showa Station of the 10th

Japanese Antarctic Research Expedition (1969-1970). The electric field, the conductivity, and the air-earth current near the surface were recorded from February 1969 to January 1970, and the observation of vertical distribution of potential gradient using radiosondes was carried out through this period. Mean values were: Electric field =66 V/m; Conductivity =1.92 x 10 exp.-14 O/m; and Air-earth current =1.56 x 10 exp.-12 Amp/sqm. A diurnal variation correlated with the worldwide thunderstorm activity was observed in the electric field and the air-earth current: the difference between maximum and minimum being about 30% of the mean value during Antarctic summer and about 20% during winter. An equation is given for the potential gradient with relation to height. There was no serious difficulty in the insulation of instruments. The main trouble was variation of the contact potential in the antenna system.

I-10072
Giles, B.D.
VARIATION OF BRIGHT SUNSHINE IN THE ANTARCTIC PENINSULA, 1945-1966. British Antarctic Survey bulletin, June, 1971 No.24, p.21-43, 15 refs.
QH84.2.B72

Published and manuscript data are presented in the form of annual, seasonal and monthly amounts of effective and relative sunshine at British stations in the Antarctic Peninsula. From these data the various means, extremes and standard deviations are calculated. The duration and the diurnal variation of sunshine are also considered. It is noted that sunshine amounts do not necessarily vary directly with latitude: local topography and the positions of the stations in relation to the Antarctic Peninsula are more important factors. (Auth.)

I-10084
Astapenko, P.D. , Treshnikov, A.F.
INTERRELATIONSHIP BETWEEN METEOROLOGY, OCEANOGRAPHY AND GLACIOLOGY IN ANTARCTIC STUDIES. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.96-121, 32 refs.
QC801.3.S6

The scientific exploration of the Antarctic during the IGY and subsequent years has been made particularly fruitful by the mutual exchange of results of field work in related disciplines. The inter-relationship between the atmospheric processes and those which determine the state of the surface beneath--in this case the ice sheet and surrounding ocean--necessitated constant and close co-operation not only between meteorologists, glaciologists and oceanographers but also between scientists of all the nations taking part in Antarctic research. Meteorologists investigating atmospheric circulation over the south polar region needed to understand the temperature variations, the thickness of ice cover, the ice mass balance, the precipitation, evaporation and movement of snow, the formation of icebergs, the temperature and salinity of Antarctic waters, as well as ocean currents. Glaciologists required for their work a knowledge of temperature changes in air and water, and of atmospheric circulation. Similarly, oceanographers are dependent on meterological and glaciological data. The results of research in these three fields during the period 1955-1960 are discussed.

I-10124
Il'ichev, IU.D. , Lysenko, I.A., Orlianskii, A.D., Petruchek, T.P.
RESULTS OF WIND MEASUREMENTS IN THE UPPER ATMOSPHERE OVER ANTARCTICA BY RADAR SOUNDING OF METEOR TRAILS. Rezul'taty izmerenii vetra v verkhnei atmosfere nad Antarktidoi metodom radiolokatsii meteornykh sledov. Meteorologiia i gidrologiia, Dec. 1970 No. 12, p.19-27, In Russian with English summary. 16 refs.
QC851.M27

Results are given of measurements of the wind regime in the upper atmosphere made from Sept 1967 to Oct. 1968 at Molodezhnaya Station by radar sounding of meteor trails. Seasonal variations of the prevailing winds, as well as variations of the amplitudes and phases of the harmonic components are discussed. The results of the measurements are compared to data from Adelaide (35S), 1952-54, Obninsk (55N), 1966-67, and Kheysa I. (81N). (Auth. mod.)

I-10127
Basharinov, A.E.
RESULTS OF OBSERVATION OF THE THERMAL RADIO EMISSION OF THE EARTH'S SURFACE IN AN EXPERIMENT ON THE COSMOS-243 SATELLITE. Rezul'taty nabliudeniia toplovogo radioizlucheniia zemnoi poverkhnosti po dannym eksperimenta na ISZ "Kosmos-243". Kosmicheskie issledovaniia, Mar.-Apr. 1971 9(2), p.268-279, In Russian. 15 refs. English translation in Cosmic research, 9(2): 247-256, Oct. 1971
QB500.K63

The basic results of a geophysical interpretation of the emission from the water spaces, continents, and ice covers as obtained in an experiment to receive the outgoing super-high frequency radiation of the earth's surface and its atmosphere on the Cosmos-243 satellite are presented. A chart of the sea-ice boundaries in the Antarctic is constructed from data obtained from Sept 23 to 26, 1969.

I-10162
Sadokov, V.P.
GRAVITATIONAL FIELD OF THE EARTH AND ATMOSPHERIC CIRCULATION. Gravitatsionnoe pole Zemli i tsirkuliatsiia atmosfery. Meteorologiia i gidrologiia, Apr. 1971 No.4, p.14-26, In Russian with English summary. 11 refs.
QC851.M27

Global charts of gravity anomalies are presented and the relationship of these anomalies with atmospheric circulation characteristics in various parts of the globe is discussed. Distribution of anticyclones in relation to gravity anomalies in the Arctic is compared to that in the Antarctic. A method for calculating gravity anomalies in prognostic equations is suggested and their significance is evaluated. (Auth. mod.)

I-10163
Budyko, M.I. , Vasishcheva, M.A.
EFFECT OF ASTRONOMICAL FACTORS ON QUATERNARY GLACIATIONS. Vliianie astronomicheskikh faktorov na chetvertichnye oledeneniia. Meteorologiia i gidrologiia, June 1971 No.6, p.37-47, In Russian with English summary. 15 refs.
QC851.M27

A numerical model is suggested for distribution of mean latitudinal air temperatures near the earth's surface both for the warm and for the cold half-years. This model takes into account the relationship of the thermal regime with the position of polar ice in the Arctic and Antarctic. The model is used for estimating the effect of changes of the earth's surface position

relative to the Sun upon the development of glaciations. It is shown that the above changes could be a cause for the glacial epochs of the Quaternary. (Auth.)

I-10164
Vasil'ev, A.A.
SYNOPTIC CHARACTERISTICS OF CLOUD SYSTEMS OVER THE ANTARCTIC COAST. Sinopticheskie osobennosti oblachnykh sistem nad poberezh'em Antarktidy. Meteorologiia i gidrologiia, Sept. 1971 No.9, p.49-55, In Russian with English summary. 7 refs.
QC851.M27

Data obtained from artificial satellites show that tropospheric vortices over the Antarctic coast are similar in their cloud structure to cyclones in the Northern Hemisphere. In consequence of peculiarities of synoptic processes in the Southern Hemisphere, one or two cyclones commonly occur on polar fronts. Mesovortices were sometimes observed in the rear of polar-front cyclones near the Antarctic coast. These vortices have a frontal structure and occur on Antarctic fronts.

I-10165
Bugaeva, I.V. , Ivanovskii, A.I., Kokin, G.A., Koshel'kov, IU.P., Riazanova, L.A., Tarasenko, D.A.
PRELIMINARY RESULTS OF A STRATO-MESOSPHERIC ROCKET EXPERIMENT. Predvaritel'nye rezul'taty raketnogo strato-mezosfernogo eksperimenta. Meteorologiia i gidrologiia, Oct. 1971 No.3, p.3-11, In Russian with English summary. 4 refs.
QC851.M27

With the aid of several research vessels and rocket sounding stations including Molodezhnaya Station and Kerguelen Is., during Oct. 1970-Feb. 1971 homogeneous data of rocket soundings over the globe were obtained. Cyclic processes in the equatorial zone, disturbances of the circulation in the polar regions of the Northern Hemisphere and spring-summer circulation in the Southern Hemisphere are considered on the basis of this material. (Auth. mod.)

I-10212
Priestley, C.H.B.
GLOBAL ATMOSPHERE: A MEMORIAL TO H.C. RUSSELL. Search, August 1971 2(8), p.273-279, 14 refs
Q1.A772

An account is given of the history of meteorology in Australia and the contributions of H.C. Russell, Government Astronomer of New South Wales in 1870 and a pioneer of the global approach to this field. His greatest contribution was the suggestion that the movement of anticyclones is a hemispheric phenomenon. Also important to the expansion of Australian research activity in meteorology were the establishment of the International Antarctic Analysis Center at Melbourne in 1959, the World Weather Center, and the Commonwealth Meteorological Research Center. The research activities of these organizations, the Global Atmospheric Research Program, and other concerted international efforts in the field of meteorology are discussed.

I-10221
Nishibe, N. , Seino, Z.
METEOROLOGICAL OBSERVATIONS DURING THE JARE SOUTH POLE TRAVERSE 1968-69. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.49-67

Throughout the period of the traverse, Sept. 28, 1968 to Feb. 13, 1969, surface meteorological observations were carried out at 06, 12, and 18 GMT, except on days spent at the Plateau and South Pole Stations. Instruments and methods of observation, all in accordance with WMO regulations, are described; results are plotted and tabulated.

I-10223
Kikuchi, K. , Fujiwara, K.
OBSERVATION OF GIANT SEA-SALT PARTICLES FROM SYOWA STATION TO THE SOUTH POLE. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.110-112, 9 refs

Air sampling of sea-salt particles by means of a hand operated impactor was started along a line 40-43 E on Oct. 9, 1968, and the sampling carried out 42 times on the roof of a caboose on the way to the South Pole. At a point near 71 S, about 1900 m above sea level, the numerical concentration of particles per liter was 10, at 77 S, about 3700 m, it was 0.5. No particles were observed between 71 - 77 S. Some background information is given on giant sea-salt particles as the most typical condensation nuclei on the continent and the numerical results compared with previous values.

I-10271
Mateer, C.L. , Dutsch, H.U.
UNIFORM EVALUATION OF UMKEHR OBSERVATIONS FROM THE WORLD OZONE NETWORK. PARTS I AND II. Boulder, Colorado, National Center for Atmospheric Research, 1964, 329p., 11 refs.

Part II of this report contains individual vertical distributions of ozone obtained by a uniform objective evaluation of Umkehr observations from the world ozone network, including Argentine Is. and Macquarie I. Also included are monthly and annual averages for the various atmospheric layers. The method of evaluation is described in detail in Part I. (Auth. mod.)

I-10272
Dutsch, H.U.
UNIFORM EVALUATION OF UMKEHR OBSERVATIONS FROM THE WORLD OZONE NETWORK. PART III. Boulder, Colorado, National Center for Atmospheric Research, 1964, 34p., 2 refs.

The results of about 3800 Umkehr observations obtained at 24 stations around the world are combined to study ozone variations with latitude and season at different levels. Several cross sections are prepared and discussed. Ozone distribution with latitude in the upper stratosphere is compared with the theoretical expectance and the influence of a possbile availability of solar UV radiation on the ozone content of those layers is discussed. Data obtained at Argentine Is. show that in the South Polar spring the highest ozone concentrations are found at the bottom of the stratosphere. This effect seems to be substantiated by observations made at Byrd Station at 80 S. (Auth. mod.)

I-10274
Khrol, V.P.
LARGE-SCALE INTERACTION BETWEEN THE OCEAN AND THE ATMOSPHERE (LITERATURE REVIEW). Krupnomasshtabnoe vzaimodeistvie okeana i atmosfery (obzor literatury), Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii

institut. Trudy, 1970 No.296, p.98-130, In Russian. Eng. transl. in: Arctic Ice Dynamics Joint Experiment, AIDJEX Bull. No. 10:117-163, Sept. 1971. 121 refs.

The investigations conducted from 1962 to 1968 on the thermal energy exchange between the ocean and the atmosphere in the total circulation of both media are briefly reviewed. Heat exchanges on the hemispheric scale and regional interactions for the Pacific, Atlantic, and the Arctic Oceans are discussed. The value of the radiation balance of the Earth decreases with the latitude, from 104 to 106 kcal/sq cm. yr at 20 N - 20 deg S to -9 to -11 kcal/sq cm. yr 80 - 90 N and 80 - 90 S, while the values of the radiation balance in the atmosphere vary within narrow limits, from -60 to -80 kcal/sq cm. yr. The latitude-dependent heat flux to the Earth and from the Earth to the atmosphere creates circulations in both the oceans and the atmosphere. These circulations cause a latitudinal heat transfer from the zone 40 N-40 S into the regions 40 - 90 N and 40 - 90 S, and establish thermal equilibrium at all latitudes. The high albedo of the snow-ice cover decreases the radiation balance of the ocean and of the ocean-atmosphere system in the polar regions.

I-10275
Bozhkov, R.D. , Lovill, J.E., Berson, F.A.
COMMENTS ON BERSON'S "SPRING-WARMING TRANSFER PROCESSES IN THE LOWER ANTARCTIC STRATOSPHERE" AND REPLY BY F.A. BERSON. Tellus, 1969 21(2), p.284-285, 4 refs.

In a paper published in 1967 (see I-5569) Berson stated that the predominant layer of maximum increasing ozone change is at 18-25 km over Antarctica. Dutsch (1964: see I-10272) and Bozhkov (1965) indicate this layer of maximum change to be approximately 8-18 km for the polar latitudes. The 18-25 km layer generally represents the region of maximum change in the mid-latitudes. The authors point to an apparent discrepancy which is based on an examination of Halley Bay data (used by Berson) which shows a different tendency in the total ozone amount during 1958 and 1960. It does not appear justifiable to use the 1958 ozone data and apply to the 1960 vertical velocity considerations. As a result, conclusions are doubtful.

I-10334
Wong, E. , Riordan, A.
MICROMETEOROLOGY AT PLATEAU STATION. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 215-216, 2 refs.

During 1967 and 1968 a micrometeorological field program was conducted at Plateau Station to obtain temperature and wind data at ten heights up to 32 m and at several depths down to -10 m. The tower data give a vivid representation of the great inversion that characterizes the thermal environment of the Antarctic surface layer. Inversions of 20 C or stronger are not uncommon occurrences with the tower height of 32 m. The most outstanding feature in the surface layer of the atmosphere is the seemingly systematic variation of the horizontal wind vector with height. Station observers have frequently reported the large wind direction difference between adjacent instrument levels under certain situations. The relationship between wind shear and atmospheric stability is discussed. Both veering and backing of the wind seem to be related to stability.

I-10335
Kuhn, M.
ELEVATED TEMPERATURE MINIMA AT PLATEAU STATION. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 217-218, 2 refs.

A necessary condition for elevated temperature minima is radiational cooling at the snow surface (R) balanced by heat conducted upward from the underlying snow, (S) and by downward turbulent heat flux in the air (Q). Thus the ratio S/Q determines whether the temperature minimum becomes elevated or not. Previous measurements have indicated that elevated minima should be an exception in the temperature profiles of Plateau Station. However, optical phenomena observed at this station have pointed to a highly complicated multiple layering. Examination of 80 daily spot checks of temperatue and wind profiles at Plateau Station in the winter night of 1967 showed that, although R is practically the same for the for the South Pole and Plateau Station, the ratio of S to Q at these stations must differ considerably: on 34 of the 80 days the minimum was higher than 25 cm above the snow surface, and the S/Q ratio of the remaining 46 cases leads one to believe that about half of them must have had elevated minima below the 25-cm level, where no temperature sensor was installed. Further observations pointing to an elevated temperature minimum are discussed.

I-10336
Schwerdtfeger, W.
REMARKABLE WIND SHIFTS AND SPEEDS A FEW METERS ABOVE THE SURFACE OF THE ANTARCTIC PLATEAU. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 218-219, 5 refs.

Spectacular variations of the wind between one and a few tens of meters of height have been observed at Plateau Station. Examination of the measurements at ten levels of the micrometeorological tower, 0.5 to 32 m above ground, leaves no doubt that this phenomenon is directly related to the presence of a strong temperature inversion. On the average, during the winter of 1967 at Plateau Station, the change of the wind direction between the 0.5- and the 32-m levels was 4, 30, and 57 degrees of azimuth when the temperature difference T32-T0.5 was <3, 8 to 12, and > 20 C, respectively. The measurements made at Plateau Station are used to test a theory (Mahrt and Schwerdtfeger, 1970; I-9516) that aims to explain the change of the wind with height in a friction layer with a horizontal temperature gradient that decreases upward exponentially. Such conditions, which exist over a sloped terrain when there is a strong surface inversion of approximately constant vertical extent, are found over the Antarctic plateau during most of the year and over Greenland, though with less persistence, during the winter. The results show good overall agreement between observations and theory.

I-10337
Rockney, V.D.
NOAA'S METEOROLOGICAL PROGRAM IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 219

The National Oceanic and Atmospheric Administration (NOAA) program has two aspects: (1) Atmospheric constituents are monitored for long-term, or benchmark, reference; and (2) Weather conditions are measured frequently and reported to the World Weather Watch, and during the summer, to U.S. Navy weather forecasters at McMurdo Station and Christchurch, New Zealand. During the 1970 austral winter, data were collected at two stations. The work at Byrd

Station consisted principally of surface weather observations. At Amundsen-Scott Station the investigations included surface synoptic weather observations, rawinsonde observations, monitoring of the explosive stratospheric warming that occurred during Sept. and Oct. 1970, measurements of the vertical profile of ozone and radiation fluxes simultaneously with the rawinsonde observations, total ozone observations, surface radiation measurements, air sampling for radioactive debris and carbon dioxide content, and measurement of atmospheric turbidity simultaneously with the surface synoptic observations.

I-10411
Ageta, Y.
SOME ASPECTS OF THE WEATHER CONDITIONS IN THE VICINITY OF THE MIZUHO PLATEAU, EAST ANTARCTICA. Antarctic record, July 1971 No.41, p.42-61, In Japanese with English summary. 21 refs.

The weather conditions from Sept. to Jan. in the vicinity of the Mizuho Plateau, the area between the coast and 72 s, are discussed on the basis of the weather observations made during the traverses of JARE-10 in 1969-70 and previous traverses. A mean wind speed of about 8-10 m/s was obtained from the observations. The observed sastrugi orientations and pitted patterns show seasonal variations. The wind direction is constant inland, but diurnal variations were observed. When the wind direction changes counterclockwise to the north from the prevailing wind direction, worsening weather can be expected. The flow lines of the prevailing winds in the vicinity of the Mizuho Plateau are drawn from the orientations of sastrugi and other features. The pressure variation inland about 350 km from Showa Station was similar to that at Showa Station. Sea-salt particles were detected at 71 S and 43 E during a light snow or ice prism fall when the wind was weak and changing direction counterclockwise from the prevailing direction.

I-10443
Kats, A.L. , Ugriumov, A.I.
TYPICAL FEATURES OF ATMOSPHERIC CIRCULATION ALONG THE 30 W MERIDIAN OF THE NORTHERN AND SOUTHERN HEMISPHERES IN APRIL-JUNE 1969. Kharakternye cherty tsirkuliatsii atmosfery v aprele-iiune 1969 g. na meridiane 30 z. d. severnogo i iuzhnogo polusharii. Kats, A.I., (ed.), Problemy tsirkuliatsii v atmosfere i gidrosfere Atlanticheskogo okeana (Problems of circulation in the atmosphere and hydrosphere of the Atlantic Ocean), Leningrad, Gidrometeoizdat, 1970, p.37-54, Text in Russian. 9 refs.
QC880.P76

The 5th Professor Vize Cruise from April to June 1969 extended from 60 N to 60 S along the 30 W meridian implementing investigations to a height of 40 km in the atmosphere and to a depth of 2000 m in the ocean. Atmospheric circulation was studied from data obtained during the cruise on the spatial and time distribution of atmospheric temperature; meridional and zonal components of wind for both hemispheres; and temperature and thermal properties of water for the Northern Hemisphere. The results verify already known features of temperature variations in the troposphere and stratosphere from Greenland to Antarctica.

I-10444
Shatunov, I.A.
VERTICAL HUMIDITY DISTRIBUTION ANL GENERAL MOISTURE CONTENT IN THE ATMOSPHERE ALONG A PROFILE FROM 60N TO 60S. Vertikal'nyi profil' vlazhnosti i obshchee vlagosoderzhanie atmosfery po razrezu ot 60 s. sh. do 60 iu. sh.. Kats, A.I., (ed.), Problemy tsirkuliatsii v atmosfere i gidrosfere Atlanticheskogo okeana (Problems of circulation in the atmosphere and hydrosphere of the Atlantic Ocean), Leningrad, Gidrometeoizdat, 1970, p. 55-65, In Russian. 11 refs.
QC880.P76

Soundings for atmospheric moisture content were made regularly 4 times a day during the Professor Vize Cruise in 1969 from 60 N to 60 S and back along the 30 W meridian. The data obtained are analyzed and presented in tables and graphs showing vertical profiles of absolute humidity, the amount of precipitable water every km up to 29 km in height, and the total amount of precipitable water in the atmosphere, as well as the intensity of direct solar radiation which is related to the values of atmospheric water vapor. It is found that 55 percent of the total precipitable water is located in the first km of the atmosphere, 90 percent in the first 5 km, 99 percent in the first 10 km, and only 1 percent between 10 and 29 km. Moisture content is twice as variable in the atmosphere as a whole, as near the water surface.

I-10477
Loon, H. van , Jenne, R.L.
ZONAL HARMONIC STANDING WAVES IN THE SOUTHERN HEMISPHERE. Journal of geophysical research, Feb.20, 1972 77(6), p.992-1003, 20 refs.

Examination of the zonal harmonic waves in the southern hemisphere by means of long-term average heights of constant-pressure surfaces from sea level to 100 mb and by daily 500-mb heights, indicates that waves 1, 2, and 3 have significant standing components. Wave 1 at extratropical latitudes has one peak in the subpolar regions and another in the subtropics. The ridge of the subpolar region is in the Pacific and the ridge of the subtropical region is in the Atlantic Ocean. The phase changes near 40 S where the amplitude tends toward nought. In summer the wave is biggest near the tropopause but in winter it continues to grow into the stratosphere over the area where the temperature drops poleward. Wave 2 has a large standing component over Antarctica with its ridges over the highest parts of west and east Antarctica. There is a well-defined wave 3 between 25 and 60 S in all months, with ridges near the three lower-latitude continents. In addition the wave has a marked peak in the upper tropical troposphere in summer, which is in phase with that at higher latitudes.

I-10531
Thompson, T.
BASIC DATA SET PROJECT FOR GARP PLANNING. Australian meteorological magazine, June 1971 19(2), p.43-47
QC851.A86

The Basic Data Set Project was initiated by the Joint Organizing Committee of the Global Atmospheric Research Program for the purpose of collecting meteorological data from as many sources as possible for the preparation of global analyses to be presented in digital form as grid point values. It was decided that data be collected for the months of Nov. 1969 and June 1970 and that the analyses be divided into 3 slightly overlapping areas: the Northern Hemisphere from 20 N to 90 N, the Tropical Belt from 30 N to 30 S, and the Southern Hemisphere from 20 S to 90 S. The data to be included in the Basic Data Sets are synoptic surface

observations and analyses, upper-air observations and analyses, meteorological observations from ships and aircraft, tracer-cloud winds from geostationary satellites, and vertical temperature profiles from satellite infrared spectrometer data (SIRS).

I-10532
Phillpot, H.R. , Price, P.G., Neal, A.B., Lajoie, F.A.
GARP BASIC DATA ANALYSIS PROJECT. THE FIRST EXPERIMENT - NOVEMBER 1969. Australian meteorological magazine, June 1971 19(2), p.48-81, 7 refs.
QC851.A86

An account is given of the techniques employed in the manual preparation of contour and isotherm analyses for the Southern Hemisphere south of lat 20 at sea level, 1000 mb, 500 mb and 200 mb for the Global Atmospheric Research Program Basic Data Set Project of Nov. 1969. Reservations are expressed on the adequacy of the final products.

I-10533
Angell, J.K.
SOME CLIMATOLOGICAL ASPECTS OF THE CIRCULATION IN SOUTHERN HEMISPHERE TEMPERATE LATITUDES AS DETERMINED FROM 200-MILLIBAR GHOST BALLOON FLIGHTS. Monthly weather review, Feb. 1972 100(2), p.107-116, 25 refs.
QC938.A2

The climatology of the 200-mb flow in Southern Hemisphere temperate latitudes is investigated for a 1-yr period using data obtained from nine global horizontal sounding technique (GHOST) balloon flights in 1966-67, eight from Christchurch, N.Z. and one from McMurdo Sound, Antarctica. In the mean for the year, the west wind is a maximum over the Indian Ocean and a minimum near Cape Horn while a mean equatorward flow of about 1m/s exists over the South Atlantic and a mean poleward flow of similar magnitude exists near South Africa. The poleward eddy flux of westerly momentum produced by wave numbers 1-4 is a maximum over the South Atlantic. Between 40 and 60 S, semiannual and annual variations in zonal and meridional wind are of similar magnitude, resulting in a west-wind maximum near the vernal equinox and a secondary maximum near the autumnal equinox. The inferred mean meridional velocity attains values of 0.3 m/s, with equatorward flow indicated as occurring in summer and autumn (when the west wind is relatively weak) and poleward flow in winter and spring (when the west wind is relatively strong).

I-10541
Fritz, S. , McInturff, R.M.
STRATOSPHERIC TEMPERATURE VARIATIONS IN AUTUMN--NORTHERN AND SOUTHERN HEMISPHERES COMPARED. Monthly weather review, Jan. 1972 100(1), p.1-7, 12 refs.
QC983.A2

Nimbus 3 satellite data are used to study stratospheric temperature patterns for the Northern and Southern Hemispheres, mainly for the periods of transition from summertime to wintertime circulation regimes. The principal region of high radiance (warm air) over the Northern Hemisphere, traditionally associated with the Aleutian anticyclone, was found to be mainly over Siberia. A corresponding warm region over the Southern Hemisphere was found, and its mean position during the transition period is only 25 deg of longitude farther to the west. Possible explanations for these positions are discussed. The role of the jet stream and the orographic features of the Antarctic continent are considered in the production of stratospheric warmings in the Southern Hemisphere.

I-10542
Hamilton, W.L. , Seliga, T.A.
ATMOSPHERIC TURBIDITY AND SURFACE TEMPERATURE ON THE POLAR ICE SHEETS. Nature, Feb. 11, 1972 235(5337), p.320-322, 13 refs.
Q1.N2

Data from the Camp Century and Byrd ice cores used to interpret the relationship between atmospheric turbidity and surface temperature on the polar ice sheet appear to indicate that millenial and longer variations in cloud-level temperature have been caused by changing atmospheric turbidity over the past 100,000 yr. Support for this supposition is developed by representing flow lines for ice midway in the core and profiles of calcium concentration and oxygen isotope ratios; comparing Lamb's volcanic dust index and Ca concentrations, and correlating (1) the difference between measured and hypothetical isotope ratios and (2) Ca concentration. Of interest is the observation that the ice core evidence suggests a decreasing cooling rate at high values of turbidity, unlike Rasool and Schneider's theoretical prediction based on scattering albedo attenuation.

I-10548
Voronov, P.S.
MIRAGES AT MIRNYY. Mirazhi Mirnogo. Chelovek i stikhiia, 1966, p.140, In Russian.
QC851.C39

Distant objects in the vicinity of Mirnyy Station were seen, appearing to be displaced and seemingly located much closer than in reality. This optical phenomenon is explained as a complete reflection at the boundaries of atmospheric layers of various density, producing a superior mirage which is typical for the polar regions during clear weather, high atmospheric pressure, and low temperature.

I-10552
Serlapov, S.T.
ANTARCTIC STORMS. Antarkticheskie uragany. Chelovek i stikhiia, 1967, p.39, In Russian.
QC851.C39

The jet streams, which are maintained by the greatest part of the kinetic energy produced in atmospheric movements, effect various weather phenomena, including pressure field formations and strong winds. These streams, which attain velocities of up to 700 km/hr over Mirnyy and Dumont d'Urville Stations, Kerguelen, New Amsterdam, Marion, and Macquarie Is., have interfered with Soviet air navigation to a considerable extent. The jet streams, which are maintained by the greatest part of the kinetic energy produced in atmospheric movements, effect various weather phenomena, including pressure field formations and strong winds. These streams, which attain veolcities of up to 700 km/hr over Mirnyy and Dumont d'Urville Stations, Kerguelen, New Amsterdam, Marion, and Macquarie Is., have interfered with Soviet air navigation to a considerable extent.

I-10570
Wisse, J.A. , Meerburg, A.J.
OZONE OBSERVATIONS AT BASE KING BAUDOUIN IN 1965

AND 1966. Archiv fur Meteorologie, Geophysik und Bioklimatologie. Ser. A, 1969 18(1/2), p.41-54. 15 refs.
QC857.A732

Daily means of surface ozone concentrations obtained in 1965 and 1966 at King Baudouin Base have been tabulated. Antarctic surface ozone data and ozone soundings show that in the troposphere up to the 400-mb level, the concentrations increase southwards of the Antarctic coast. The concentrations are greatest in winter and least in summer. These features are tentatively explained as a consequence of the mean meridional circulation, the cyclonic activity and ozone destruction at the surface of the Antarctic ocean. Inversion observations at King Baudouin Base revealed that the ozone content above 30 km is least in summer. The springtime stratospheric warming in 1965 and 1966 as well as a midwinter warming in 1966 at King Baudouin Base are described. (Auth.)

I-10573
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA - MARION - 1963. Pretoria, 1966, 151p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station on Marion I. are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-10574
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA -- GOUGH -- 1963. Pretoria, 1966, 143p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station on Gough I. are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of troppopause levels, and mean values.

I-10575
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA - SANAE - 1963. Pretoria, 1966, 126p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station at SANAE Station are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-10599
Bastin, P.E.
BELGIAN ANTARCTIC EXPEDITION 1959; UPPER AIR METEOROLOGICAL OBSERVATIONS. Expedition Antarctique Belge 1959: observations meteorologiques en altitude. Brussels. Institute Royal Meteorologique de Belgique. Publications. Ser. A, 1966 No. 58, 171p., In French.
QC851.B824

This publication contains all the meteorological observations aloft made by the Belgian Antarctic Expedition of 1959 at the Roi Baudouin Base during Jan. 1, 1959-Jan. 31, 1960 and at sea (69 S. 16 -22 E during Jan. 8-Feb. 5, 1959. In addition to the tables with the daily radiosonde and radio wind observations, the publication contains a brief description of the organization of the national centers for the Antarctic Expedition of 1959, a list of the members of the expedition, a map of the location of the Roi Baudouin Base, maps of the surroundings of the base, the relief of the surroundings of the base, and a list of publications.

I-10635
Treshnikov, A.F. , Borisenkov, E.P.
SOVIET PROPOSAL FOR A POLAR METEOROLOGICAL PROGRAMME WITHIN THE FRAMEWORK OF THE GLOBAL ATMOSPHERIC RESEARCH PROGRAMME. Polar record, Sept. 1971 15(99), p.927-931, 3 refs.
G575.P6

The polar regions, constituting a zone of intense energy outflow to space, merit a sub-study similar to the Tropical Sub-Program of the Global Atmospheric Research Program (GARP). It seems expedient that GARP should be preceded by specifically polar experiments such as POLEX (polar experiment) proposed by the USSR at the First Conference on GARP Planning and Implementation, held in Brussels in March 1970. The experiment should be carried out first in the Arctic regions and later, and only as an international effort, in the Antarctic. A brief outline of the argument for POLEX is given.

I-10686
Japanese Antarctic Research Expedition (Nihon Nankyoku Chiiki Kansokutai)
ANTARCTIC METEOROLOGICAL DATA. VOL. 10. METEOROLOGICAL DATA AT THE SYOWA STATION IN 1969. Tokyo, Japan Meteorological Agency, 1971, 147p.
QC994.9N55

Tabulations of meteorological observations carried out by the 10th Japanese Antarctic Research Expedition at Showa Station from Jan. 1969 to Feb. 1970 include surface, aerological, and total radiation data. The data are recorded variously as hourly, daily, monthly, and synoptic summaries. Instruments and methods of observation are described.

I-10687
Japanese Antarctic Research Expedition (Nihon Nankyoku Chiiki Kansokutai)
ANTARCTIC METEOROLOGICAL DATA. VOL. 11. METEOROLOGICAL DATA AT THE SYOWA STATION IN 1970. Tokyo, Japan Meteorological Agency, 1971, 151p.
QC994.9N55

Tabulations of meteorological observations carried out by the 11th Japanese Antarctic Research Expedition at Showa Station from Jan. 1970 to Feb. 1972 include surface, aerological, and total radiation data. The data are recorded

variously as hourly, daily, monthly, and synoptic summaries. Instruments and methods of observations are described.

I-10689
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA--SANAE--1966. Pretoria, 1968, 173p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station at SANAE Station are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adopted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-10699
Kikuchi, K.
OBSERVATIONS OF THE ATMOSPHERIC ELECTRIC FIELD AT SYOWA STATION, ANTARCTICA. Meteorological Society of Japan. Journal, Oct. 1970 48(5), p.452-460, 13 refs.

Observations of the atmospheric electric field strength were carried out by means of a Field Mill type electrometer at Showa Station, Antarctica, from the beginning of Feb. 1968 to the end of Jan. 1969. As a result, the following data were obtained: (1) no remarkable diurnal variations in undisturbed electric field, (2) a positive correlation between the positive electric field and wind velocity, (3) undisturbed electric field accompanied by southerly winds, (4) an electric field accompanied by drifting and blowing snow, (5) a difference of the commencement time of the increase of a positive electric field and (7) a disturbance of the electric field as influenced by the aurora.

I-10700
Gauntlett, D.J. , Hincksman, D.R.
SIX-LEVEL PRIMITIVE EQUATION MODEL SUITABLE FOR EXTENDED OPERATIONAL PREDICTION IN THE SOUTHERN HEMISPHERE. Journal of applied meteorology, Aug. 1971 10(4), p.613-625, 15 refs.

A description is given of a primitive equation model designed specifically for extended operational prediction in the Southern Hemisphere. The model closely resembles in dynamical and physical aspects the well known Smagorinsky general circulation formulation. In addition to improved initialization procedures, important modifications were made to this original formulation to ensure compatibility with operational requirements. Simulated operational trials with the model indicate considerable promise especially in regard to the predicted intensity of synoptic systems and associated large-scale rainfall distributions. Predictions and verifications at msl and at 500 mb illustrate application of the comparative initialization experiments for the Antarctic region. (Auth. mod.)

I-10702
Decleir, H. , Decloedt, J.
METEOROLOGY. RADIATION. BASE ROI BAUDOUIN, FEB. 1966-DEC. 1966. Brussels, Exantar, 1971, 60p., 4 refs.

The radiation program of the 1966 Belgian-Netherlands Antarctic Expedition at Base Roi Baudouin included measurements of the duration of sunshine, global solar radiation, and sky radiation. Tabular data are presented indicating semi-hourly values of global and sky radiation, expressed in kcal/sqm, and hourly values of the duration of sunshine, given in tenths of hours. A visual display of the duration of sunshine suggests a decrease of clear days towards the winter. The relative duration of sunshine and the complement of cloudiness compare well for the period Sept.-Mar., but show a considerable discrepancy towards the winter. Isopleths of the mean monthly global and sky radiation are concentrically displayed around a maximum in Dec. at noon.

I-10703
Kraan, C.
ATMOSPHERIC ELECTRICITY. BASE ROI BAUDOUIN, FEB. 1966-FEB. 1967. Brussels, Exantar, 1971, 134p., 15 refs.

The atmospheric electricity program at Base Roi Baudouin during 1966 consisted of continuous ground-level measurements of the electric field, the electrical conductivity of the air, and the conduction of current density; measurements of field behavior in the upper air; and special investigations of the electrode effect and the influence of auroral phenomena. The results of these observations are presented, in addition to a description of the instruments used.

I-10704
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA--SANAE. Pretoria, 1969, 1970, 1971, 153p.; 133p.; 125p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station at SANAE Station are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adopted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of levels, heights of tropopause levels, and mean values.

I-10725
Hisdal, V.
DIURNAL VARIATIONS OF SURFACE WIND OVER THE ANTARCTIC ICE SHELF. Oslo. Norsk polarinstitutt. Årbok, 1972 No. 1970, p. 76-91, 19 refs.
G575.078

For the three Antarctic ice shelf stations considered (Norway St., Maudheim, and Halley Bay) it is shown that a systematic diurnal variation of the mean vector wind at the surface exists from spring to autumn. Different factors that may be responsible for this variation are discussed. The results seem to agree well with the assumption that in areas far from the ice front the main cause is the larger net gain of momentum in the lowest layers during the middle of the day, while closer to the ice front there is an additional effect of the varying contrast between the air temperature over the sea and over the ice shelf.

I-10738
Vinje, T.E.
TURBULENT TRANSFER OVER AN ANTARCTIC ICE SHELF.

Oslo. Norsk polarinstitutt. Skrifter, 1969 No.148, 55p., 38 refs.

Data on temperature and wind profiles obtained from a 40 m high tower on the ice shelf at Norway Station from March 7, 1957 to Dec. 18, 1959 show great dissimilarities in the upper level where a maximum wind speed of about 30 m/sec occurs quite frequently. This suggests that the shearing stress may decrease considerably within the lowest three decameters over the ice shelf. The temperature profile changes markedly as stability increases, and both temperature, and wind speed profiles differ for easterly and westerly wind directions under otherwise similar conditions. For isothermal conditions a power profile represents the wind speed observations better than a logarithmic profile. A vortex theory on the turbulent transfer suggests that the Karman constant may be determined from the power profile exponent and further that it decreases with increasing stability. The turbulent properties calculated according to the vortex theory are in fair agreement with other calculations. The mean vertical extension of the surface vortices for small wind speeds is of the same magnitude as the mean amplitude of the unevennesses on the surface (20 cm). The onset of drifting snow causes a relative reduction in wind drag, the maximum coefficient value occurring when the profile exponent is about 0.25 - 0.30. A similar critical value of the exponent is also indicated by the temperature gradient variations.

I-10739
Harsson, B.G.
SECOND TROPOPAUSE, A STATISTICAL AND PHYSICAL STUDY. Oslo. Norsk polarinstitutt. Skrifter, 1971 No.155, 38p., 17 refs.

Studies of the second tropopause carried out at seven radiosonde stations, two in Antarctica (Norway and Halley Bay Station), three in Norway, and two in the Atlantic Ocean are described. More than 4200 ascents in five winters from 1957 to 1961 have been investigated. At all stations the second tropopause is found to occur more frequently during the day than during the night. For five stations this difference is statistically significant. The material available does not show an interrelation between the presence of the second tropopause at noon and at midnight. For the layers between the standard pressure surfaces, 12 hourly mean vertical velocities are calculated for Norway Station in the course of three winter months. A relation is found between the vertical velocity in the layer where the second tropopause occurs and that of the layer below. A computation indicates that absorption of short-wave radiation by ozone may give temperature changes large enough to form a second tropopause. Ozonesonde data studied show that during the daytime there is a clear connection between ozone concentration and occurrence of second tropopause, while during the night-time, there seems to be no such connection. (Auth. mod.)

I-10740
Robbins, R.C. , Robinson, E.
ATMOSPHERIC CARBON MONOXIDE CONCENTRATIONS OVER THE SOUTH PACIFIC. FINAL REPORT. SRI Project No. PRU-6143, Stanford Research Institute, May 1968, 12p., 8 refs.

Atmospheric concentrations of CO were determined during Eltanin Cruises 27 and 29 in the South Pacific. The analyses were made using 4-liter air samples obtained aboard ship at a well-exposed deck location. Data from Cruise 27 along 177 E in Jan. 1967 indicated increasing CO concentrations from a low of 0.02 ppm at 65 S to about 0.08 ppm at 77 S. Data from Cruise 29 along 28 S between 75 W and 155 E in June and July 1967 showed generally higher concentrations, averaging about 0.08 ppm, and some tendency for maximum concentrations to occur in the South Pacific anticyclone. The possibility of an oceanic source for CO is discussed. (Auth. mod.)

I-10752
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA--GOUGH--1964. Pretoria, 1966, 163p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station on Gough I. are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-10757
Belov, V.F. , Zaitseva, N.A., Kostianoi, G.N., Shliakhov, V.I.
PRELIMINARY RESULTS OF INVESTIGATIONS OF THE LONG-WAVE RADIATION FIELD IN THE ANTARCTIC. Predvaritel'nye rezul'taty issledovaniia polia dlinnovolnovoi radiatsii v Antarktide. Meteorologiia i gidrologiia, May 1971 No.5, p.30-36, In Russian with English summary. 5 refs.

The results are analyzed of long-wave radiation field measurements which were obtained for the first time with the help of actinometric radiosondes during the 11th Soviet Antarctic Expedition at Molodezhnaya Station from March 8 to Nov. 11, 1966. The vertical variability of long-wave radiation fluxes and their relationship with air temperature and humidity are discussed. The relationship of time variation of the radiation field with changes of the synoptic conditions within the station area is shown.

I-10758
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA--MARION (0130 SAST)--1968. Pretoria, 1969, 138p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station on Marion I. are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-10762
Schwerdtfeger, W.
VERTICAL VARIATION OF THE WIND THROUGH THE FRICTION-LAYER OVER THE GREENLAND ICE CAP. Tellus, 1972 24(1), 11 refs.
QC801.T4

The peculiar wind spirals observed at Station Centrale, Expeditions Polaires Francaises 1949-51, are explained by accounting

for the effect of the thermal wind due to the presence of a strong surface inversion over sloped terrain. According to Bedel, the slope of the terrain around Station Centrale is approx 1/500, with the fall line toward 240. These features make the station quite comparable to stations on the high plateau of Antarctica (e.g. Plateau, Vostok and South Pole), and thus an analysis of the wind in the friction-layer at each of the locations should lead to similar results. The results of the soundings at Station Centrale appear to indicate that the peculiar features of the wind profiles over Greenland's inland ice can be explained by the inversion-wind concept. The results from three groups of five soundings each made at Station Centrale are supported by those obtained from much larger numbers of soundings over the Antarctic Plateau (F-8328).

I-10773
Bullock, B.R. , Johnson, D.R.
GENERATION OF AVAILABLE POTENTIAL ENERGY BY SENSIBLE HEATING IN SOUTHERN OCEAN CYCLONES. Australia. Bureau of Meteorology. International Antarctic Meteorological Research Centre. Technical report, Sept.1971 No.13, 47 p., Also in Royal Meteorological Society. Quarterly journal 98 (417):495-518, July 1972. 20 refs.

Estimates are presented of the generation of the available potential energy by sensible heating in the boundary layer for the developing and occluding stages of one cyclone and the occluding stage of a second, both located in the Southern Ocean. Boundary layer frictional dissipation is also estimated to contrast the relative importance of the storm's energy source by diabatic processes with its sink by fictional effects. It appears that the in situ diabatic source of storm available potential energy is significant in the cyclogenetic stage but its importance decreases as the storm decays. Because of the paucity of data in the Southern Ocean a simplified model to estimate the sensible heat flux is developed in this study. The model estimates the upward flux through the sea-air interface for the synoptic scale from the analyses of the depth of the adiabatic boundary layer, the surface pressure and the sea surface temperature.

I-10790
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA--MARION (0130 SAST) 1969; (1330 SAST) 1969; (0130 SAST) 1970; (1330 SAST) 1970. Pretoria, 1970, 1971, 141+132+123+117p.

The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station on Marion I. are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-10795
Kuhn, M.
GLOBAL POLLUTION IN ANTARCTIC AIR DOCUMENTED BY SOLAR RADIATION DEPLETION. Antarctic journal of the United States, March-April 1972 7(2), p. 35-37, 17 refs.

Available reports on the transmittal of direct solar radiation in Antarctica were surveyed for the period 1950 to 1968 to determine worldwide air pollution. Indicative of the amount of aerosols in the air, from natural and manmade sources, decreases in direct solar radiation reaching the earth's surface were reduced to the same pyrheliometric scale and to mean solar distance to unify observations. Before eruption of Mt. Agung, Indonesia on March 18, 1963, data showed relatively consistant turbidity coefficients which increased about sevenfold (at the South Pole) after the erupting volcanic ash entered the antarctic stratosphere in November 1963. Tables showing quantitative results and turbidity coefficients at coastal and inland stations before and after the Mt. Agung eruption are given. The absorption of solar radiation by aerosols, higher in 1967 and 1968 are interpreted as the effect of remaining volcanic aerosols rather than manmade causes. A similar evaluation is given to radiation measurements at Mauna Loa during 1958-1970, the values returning to the pre-Mt. Agung level only by the end of 1970. At the present state of investigations the increases of atmospheric turbidity is of the same order of magnitude in Antarctica and Hawaii.

I-10829
Maksimov, I.V. , Sleptsov-Shevlevich, B.A.
CONTRIBUTION TO THE STUDY OF THE 11-YEAR PRESSURE WAVE OF SOLAR ORIGIN IN THE SOUTHERN HEMISPHERE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.516-518, Translated from its Informatsionnyi biulleten' No.77, 1970. 2 refs.
Q115.S6862

The 11-year fluctuations of the average annual atmospheric pressure were studied from observations at 50-70 points in the Southern Hemisphere for the periods 1900-1911, 1913-1923, 1923-1933, and 1933-1943 (solar cycles Nos. 14, 15, 16, and 17). The data for each 11-year period were analyzed by the harmonic method. The results show the phases of the 11-year pressure wave, the amplitudes of the wave, and the distribution of the amplitudes of the 11-year pressure wave in the Southern Hemisphere as a function of the latitude of the observation point. The deformational scheme of the wave presumes that its nodes are located around the 35th parallel and its antinodes in the polar region and near the equator. Near the equator the waves must be at least twice as weak as near the pole. The maximum amplitudes of the solar pressure wave, obtained from observations, proved to be similar at 60-70 deg. The average annual atmospheric pressure experiencing rhythmic 11-year variations changes by more than 2 mm Hg in the course of this cycle. This indicates that the effect of the 11-year solar rhythm on atmospheric pressure is significant and can play an important role in the formation of the pressure field of the Southern Hemisphere.

I-10830
Chernigovskii, N.T.
SURFACE ALBEDO OF ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.519-521, Translated from its Informatsionnyi biulleten' No.77, 1970. 5 refs.
Q115.S6862

Data on the surface albedo of Antarctica for a series of observation points include the following: annual values of the albedo of the surface, the annual variation of albedo (monthly, seasonal, and annual means), seasonal values of surface albedo of dry land at a number of

stations outside the ice cover, and the dependence of surface albedo upon solar elevation. Albedo decreases with increase in solar altitude. The seasonal values of surface albedo are: for winter 87 percent, for spring 87 percent, for summer 85 percent, and for fall 89 percent.

I-10831
Diubkin, I.A.
ESTIMATE OF THE STABILITY OF AVERAGE MONTHLY WIND PARAMETERS AT MIRNY OBSERVATORY. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.521-524, Translated from its Informatsionnyi biulleten' No.77, 1970. 6 refs.
Q115.S6862

Data obtained at Mirnyy Station during the 12-yr period of observations on the variability of the mean monthly wind velocities, the 95 percent confidence limits, and the number of days with winds of 15 m/sec or more are given and analyzed. Values of wind variability in 1967 are compared to those for the preceding 11 years. It is concluded that the features and intensity of atmospheric processes differ significantly in various years on the Antarctic coast. The maximum dispersion of mean monthly values occurs in the cold, and the minimum in the warm periods of the year. The degree of approximation of the mean monthly values of the parameters for individual years to their long period normal is on the average 1.5-2.0 less in winter than in the other seasons.

I-10832
Lysakov, E.P.
CHANGE-OVER OF THE CIRCULATION IN THE ANTARCTIC STRATOSPHERE IN THE SPRING OF 1966. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.524-527, Translated from its Informatsionnyi biulleten' No.77, 1970. 11 refs.
Q115.S6862

Daily 50-mb charts of the Southern Hemisphere for Oct., Nov. and the beginning of Dec. were used to show circulation characteristics. The indices were calculated for the zone of 50-80 S lat. A map shows the locations of centers of pressure formation and heat and cold centers at 50-mb in Oct.-Nov. 1966 over Antarctica and a graph of the variation of the zonal and meridional indices during Oct.-Nov. 1966 at 50 mb. The variation of the indices corresponds fully to the variation of the atmospheric circulation. In the last decade of Nov., the meridional transport is no longer the decisive factor in the establishment of the summer circulation of the stratosphere over Antarctica. The transition of the zonal index to a positive value may serve as a criterion for the establishment of the summer regime in the stratosphere above Antarctica. This regime was established at the 50-mb level on Nov. 29, 1966; this date is close to the normal. (Meteorol. Geoastrophys. Abstr.)

I-10847
Aleksandrov, A.S.
AEROLOGICAL CHARACTERISTICS OF THE MIRNY AREA ACCORDING TO 1968 OBSERVATIONS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.579-583, Translated from its Informatsionnyi biulleten' No.78, 1970. 3 refs.
Q115.S6862

Upper-air data obtained in 1968 at Mirnyy Station were used to study thermal and wind regimes of the troposphere and stratosphere, tropospheric jet streams, and tropopause heights and temperatures. An analysis of the average temperature distribution during one year shows a distinct seasonal pattern of the isotherms with a temperature maximum in summer and a minimum in winter. SE katabatic winds prevailed at the surface throughout the year, except in Jan. and Nov.; easterly winds are found at the 850-mb level; and above this level, there was no definite prevailing flow in the troposphere. Data show that 136 jet streams were recorded in 1968, which varied greatly in duration and velocity, with an average frequency of about 11 per month. The mean monthly tropopause height maximum, 10.6 km, was recorded in Aug. and the minimum, 8.7 km, in Feb. While the height maximum and temperature minimum of the tropopause were recorded in the same month, the height minimum and temperature maximum did not coincide--the temperature minimum was observed one month earlier, in Jan.

I-10856
Gernandt, H. , Vinogradov, N.D.
RECEPTION OF SATELLITE INFORMATION AT MIRNY OBSERVATORY. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.611-612, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862

Meteorological data obtained from satellites by the 13th Soviet Antarctic Expedition at Mirnyy Station were used for operational flight weather forecasts along the Mirnyy-Vostok and Mirnyy-Molodezhnaya routes. The information in the form of cloud photographs was transmitted by the U.S. ESSA-6 weather satellite, one frame every 5.9 min. No more than three photographs could be received during a satellite pass, each photograph recording the position of cloud systems over an area of 2500 sq km. Interpretation of the photographs, showed the spatial cloud distribution and structure of the cloud field, determined by air flow parameters and giving indirect indication of the processes taking place in the atmosphere.

I-10857
Gernandt, H. , Shamont'ev, V.A.
USE OF SATELLITE DATA IN ANTARCTIC NAVIGATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.613-614, Translated from its Informatsionnyi biulleten' No.78, 1970. 4 refs.
Q115.S6862

Satellite data are being used increasingly for weather forecasting and for navigational purposes. Satellite observations make it possible to define the drift of icebergs, accumulations of fast and drift ice, and variations of the general position of the ice coast. The procedures used in assembling ESSA-6 satellite photographs for short-range weather forecasts and an actual case of relaying information to the Ob' by radio transmission are cited. The use of Kosmos satellite information by the Professor Vize is mentioned.

I-10867
Ono, I. , Satomi, M., Jobashi, H.
METEOROLOGICAL OBSERVATIONS OF THE 11TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1970. Antarctic record, Dec. 1971 No.42, p.16-34, In Japanese with English summary.

This paper describes the results of meteorological observations (surface and

aerological) at Showa Station between Feb. 1, 1970 and Feb. 20, 1971. Methods and instruments of observation are the same as those used in 1969. Observed results were regularly sent to Mawson Station. Some meteorological characteristics of this year were as follows; 1) Temperature in the winter season was lower than the average. 2) Continuation of bad weather was experienced in Apr., May and July. 3) Snow accumulation was larger than that of the preceding year. 4) Strato-warming at 50mb(20km) level was one week later than the preceding year. The observations of total amount of ozone were carried out on every suitable day through the year except the polar night intervals. A specialy designed long-term meteorograph was installed at Mizuho Camp on July 21, 1970.

I-10868
Maki, T.
RELATIONSHIP BETWEEN THE VISIBILITY AND THE WIND VELOCITY IN DRIFTING SNOW AT SYOWA STATION. Antarctic record, Dec. 1971 No.42, p.35-42, In Japanese with English summary. 4 refs.

The relation between visibility and wind velocity was investigated at Showa Station from May to Aug. 1970. Occasionally, blowing snow was mixed in snowfall. The results are summarized as follows: Snow particles start to drift when the wind velocity at 10m height becomes greater than 8m/s and the visibility becomes 150m with a wind velocity of about 15m/s; 10m at about 25m/s; and 2-3 at about 35m/s. The visibility observed at 1.5m height (V) is inversely proportional to the fifth power of wind velocity. Friction drag is almost proportional to the fifth power of velocity at 10 m.

I-10880
Robin, G. de Q. , Hisdal, V.
UPPER WIND (MAUDHEIM, 71 DEG 03 MIN S, 10 DEG 56 MIN W). Norwegian-British-Swedish-Antarctic Expedition, 1949-52. Scientific results, 1971 Vol.1, Pt.1D, Aerology, p.143-173
Q115.N84

While at the surface the strongest and most frequent winds are concentrated around the main directions 060 deg and 090 deg, south-westerly winds become more and more dominating towards higher levels. The frequency of winds in the north-east sector relative to that in the south-west sector is much greater during summer time, especially in the troposphere. The lowest mean wind speeds are found at the surface, and also, during the summer season, at the uppermost stratospheric levels. During the rest of the year these upper stratospheric levels are distinguished by very high mean speeds. There is furthermore a maximum zone slightly below the tropopause. For all seasons the greatest mean wind speeds are found in the vicinity of the tropopause for directions between south and west. Apart from the summer season large values are found in the stratosphere as well. The vector mean wind for the summer season is smaller than in other seasons, and the clockwise turn changes to an anti-clockwise turn when the 150 mb surface is passed. The standard vector deviation of the wind is generally greatest in the vicinity of the tropopause. The "steadiness", which is mainly a measure of the variability of wind direction, has its high values at the surface and in the stratosphere. During most of the year the smallest "steadiness" is found at the 850 or 700 mb level.

I-10890
Loon, H. van
HALF-YEARLY VARIATION OF THE CIRCUMPOLAR SURFACE DRIFT IN THE SOUTHERN HEMISPHERE. Tellus, 1971 23(6), p.511-516, 10 refs.
QC801.T4

The annual march of the zonal geostrophic wind at sea level in middle and high southern latitudes includes a marked half-yearly wave whose phase reverses near 50 S. South of this latitude the maxima are in the transitional seasons and north of it in the extreme seasons. Surface-current velocities at middle latitudes in the western Indian Ocean suggest that the circumpolar current may vary semiannually in the same sense as the wind.

I-10896
Lipovka, A.V.
SOME PATTERNS OF TRANSFORMATION OF ATMOSPHERIC CIRCULATION TYPES IN THE SOUTHERN HEMISPHERE IN RELATION TO SOLAR ACTIVITY VARIATIONS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.396-401, Translated from its Informatsionnyi biulleten' No.75, 1969. 12 refs.
Q115.S6862

Data on synoptic processes in the Southern Hemisphere and weather characteristics on the Antarctic coast were studied to determine patterns for the development and transformation of types of the atmospheric circulation in periods of different solar activity from 1956 to 1965. The results show that during increased solar activity in 1956-1957 meridional types of circulation developed anomalously and cyclonic activity intensified, contributing maximal snow accumulation in Antarctica; during decreasing solar activity in 1962-1964, zonal circulation occurred anomalously and cyclonic activity weakened. Transformation of atmospheric circulation types occurs immediately after a change in solar activity. Years of anomalous development of meridional circulation are the warmest years at high latitudes and those of zonal circulation are the coldest years.

I-10897
Savitskii, G.B.
METEOROLOGICAL CONDITIONS DURING THE 13TH ANTARCTIC CRUISE OF THE R/V OB' IN 1967-1968. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.401-404, Translated from its Informatsionnyi biulleten' No.75, 1969. 3 refs.
Q115.S6862

To study synoptic processes in the Southern Hemisphere, standard meteorological observations were carried out during the 13th Antarctic cruise of the Ob' in 1967-68. Altogether 123 weather forecasts were issued during the cruise for which purpose 440 surface and upper air weather maps were analyzed. The data supports the existence around Antarctica of a low-pressure belt, which is generally located between 57 and 65 deg S. As a rule, cyclones move here from W to E in an unbroken series with frequent formation of ridges from the subtropical high and the Antarctic anticyclone and the development of cols. Weather conditions in all climatic zones crossed by the Ob' reflect in general, the known circulation features typical for each zone.

I-10898
Tsigel'nitskii, I.I.
ANOMALOUS WARMING IN THE STRATOSPHERE OF EAST ANTARCTICA IN 1964-1965. Sovetskaia antarkticheskaia ekspeditsiia, 1955-.

Information bulletin, April 1971 7(5), p.405-407. Translated from its Informatsionnyi biulleten' No.75, 1969. 7 refs.
Q115.S6862

The results of temperature-wind soundings at Mirnyy Station from 70 to 20mb, of measurements of total ozone content, and synoptic charts of the Southern Hemisphere were used to explain the causes of stratospheric warmings. Stratospheric warming was observed in both cases late in winter and preceded the springtime transformation of atmospheric processes. The fluctuations of temperature were considerable during the warming periods, reaching 30-40 C at the 20-mb level. Deep cyclones with low pressures were observed at the surface during the warmings. Wind velocity increased with temperautre in the lower stratosphere. The stratospheric warmings were accompained by a slight increase in total ozone content.

I-10899
Belov, V.F. , Chernyshenko, IU.M.
NACREOUS CLOUDS OVER MOLODEZHNAYA STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.408. Translated from its Informatsionnyi biulleten' No.75, 1969. 1 ref.
Q115.S6862

Time of occurrence, color, and structure of nacreous clouds, atmospheric temperature, pressure, relative humidity, and wind regime over Molodezhnaya Station on June 16, 1968, are discussed. It was concluded that cyclonic circulation in the lower and middle stratosphere produces a steady wintertime stratospheric jet stream, moving N where the greatest temperature contrasts occur. Under these conditions, a flux of water vapor up to the upper stratosphere is observed when ascending movements are sufficiently developed and considerable turbulence in the jet stream occurs. With the very low air temperature in winter at a height of 20-27 km in the stratosphere the vapor condenses or sublimates causing nacreous clouds to form.

I-10905
Diubkin, I.A. , Zusman, IU.M., Kokoulin, V.I.
RELIABILITY OF REMOTE AIR HUMIDITY RECORDING IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.421-425, Translated from its Informatsionnyi biulleten' No.75, 1969. 4 refs.
Q115.S6862

Data on atmospheric humidity received continuously by means of the EMP-209 electronic bridge at Mirnyy Station since Feb. 15, 1967 were studied for accuracy and reliability by comparison with data obtained from the station psychrometer at air temperature from 1 to -10 C which is used as the relative standard. An analysis of distribution of differences in the air humidity values, obtained from the station psychrometer and from the graph of the electronic bridge shows that more than 95 per cent of the air humidity differentials do not exceed 4 per cent. It was concluded that the recording accuracy of the bridge satisfies the existing requirements. The advantage of this recording method is that the measurements can be made under any weather conditions, and the humidity read at any time.

I-10911
Reviakin, V.V. , Shamont'ev, V.A.
HYDROMETEOROLOGICAL CONDITIONS DURING THE FIRST VOYAGE OF THE R/V PROFESSOR VIZE TO THE ANTARCTIC IN 1967. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.439-440, Translated from its Informatsionnyi biulleten' No.76, 1969.
Q115.S6862

The results of observations of air temperature, pressure, and circulation, relative humidity, clouds, and water temperature carried out during the first voyage of the Professor Vize from Leningrad to Mirnyy Station in 1967 are discussed. Data on the variations of hydrometeorological elements along the ship's route are graphed.

I-10913
Dolgin, I.M. , Sokolov, S.I.
SOME FEATURES OF THE ATMOSPHERIC TEMPERATURE REGIME IN THE MIRNYY REGION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.442-448, Translated from its Informatsionnyi biulleten' No.76, 1969. 7 refs.
Q115.S6862

Data on the mean monthly atmospheric temperatures at Mirnyy from 1957 to 1966, on inversion characteristics in the Mirnyy area and at "North Pole 7" Station, and results of a comparison of average temperatures for 5 to 10 yr periods in the Mirnyy area from 850 to 50 mb are tabulated and discussed. The results of observations are also given in the form of graphs of the annual trend of tropopause height and temperature over Mirnyy in 1957, 1958, and 1959, the deviations of mean air temperature from the long-period average during individual years, the deviations of mean monthly temperature in Oct. of different years from the long-period average, and daily air temperature values at 50-mb surface in Sept.-Nov. 1957, 1958, and 1959.

I-10925
Japanese Antarctic Research Expedition (Nihon Nankyoku Chiiki Kansokutai)
ANTARCTIC METEOROLOGICAL DATA. ATMOSPHERIC OZONE (1966-1970); ATMOSPHERIC ELECTRICITY (1967-1970); LONG WAVE RADIATION (1966-1970). Tokyo, Japan Meteorological Agency, 1972, 145p., Special volume. Tables.
QC994.9N55, DAS, M(055)J3

Tabular upper air data of atmospheric ozone, atmospheric electricity and long wave radiation fluxes observed by specially designed radiosondes at Showa Station are presented. Explanations of the data and instruments are given.

I-10928
Loewe, F.
LAND OF STORMS. Weather, Mar. 1972 27(3), Ohio State University. Institute of Polar Studies. Contribution No.120, p.110-120, 28 refs.
QC851.W4

Meteorological conditions at Cape Denison (67 deg 1 min S, 142 deg 41 min E) a winter station used by Mawson's expedition during 1912 and 1913, and Port-Martin (66 deg 49 min S, 142 deg 24 min E), maintained by the Expeditions Polaires Francaises from Feb. 1950 to Jan. 1952 are discussed and compared with those at other Antarctic stations, including wind speed, wind direction, blowing snow, temperature structure, katabatic wind, cooling power, and origin of extreme wind speed. The strength of the winds along this part of the Antarctic coast between Adelie Land and King George V Land during extended periods is unequalled anywhere on the surface of the earth, including other parts of Antarctica. The winds have extreme steadiness,

uniform direction, and carry great masses of snow from the interior of the Antarctic ice sheet. The reasons for the extraordinary wind velocities in this part of the lower Antarctic slope and on the bordering coast line of the continent are not established.

I-10937
Pearman, G.I. , Garratt, J.R.
GLOBAL ASPECTS OF CARBON DIOXIDE. Search, Mar. 1972 3(3), p.67-73, 44 refs.
Q1.A772

The literature on aspects of global carbon dioxide is reviewed and some crude estimates made of the size of possible sources and sinks of carbon dioxide. Recent global trends in atmospheric carbon dioxide concentration are illustrated as observed at four monitoring stations: Barrow, Alaska, Swedish flights over the North Atlantic, Mauna Loa, Hawaii, and Antarctica. Present evidence is not sufficiently compelling to relate completely the increased atmospheric carbon dioxide content with carbon dioxide from increased fossil fuel combustion, or to establish that such trends will continue. The assumption that twentieth century warming was a result only of this increase, particularly with the reversal in global temperature trends observed in the last two decades is questionable. With imprecise knowledge on the causes of atmospheric carbon dioxide changes, the effect of fossil fuel combustion on atmospheric carbon dioxide and the part played by carbon dioxide in the global radiation balance and its effect on atmosphere circulation and climate, attention should be given to the subject, in the context of atmospheric pollution in general. There is particular need for a mid-latitude monitoring center in the southern hemisphere for which, at present, there is no data.

I-10960
Novikova, N.F. , Tsitovich, T.A.
SOME SPECIAL FEATURES IN THE DISTRIBUTION OF TEMPERATURE IN THE LOWER TROPOSPHERE OVER ANTARCTICA. Antarctic (Antarktika), 1971, p.103-114, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 5 refs.

The most probable explanation for a high surface inversion (as high as 3-4 km) is the conjunction of a surface radiation inversion with a subsidence inversion in an anticyclone. The results confirm this hypothesis, and at the same time it is found that a conjunction of a radiation inversion and a frontal inversion may occur. Tables show the frequency of various upper boundaries of surface inversions as observed by radiosonde ascents at Mirnyy and Vostok Stations in 1958 and 1959. An analysis of synoptic maps and vertical profiles, constructed for cases of high inversions at these stations in 1958, leads to the conclusion that the specific characteristics of surface inversions on the Antarctic coast and on the ice cap are determined by the conditions under which they are formed. On the coast the greatest activity of synoptic processes takes place in winter; only with these intensive processes are the significant descending movements and thick frontal zones possible which lead to the conjunction of several inversions to form high inversions to 3-4 km. Further inland, where only the peripheries of cyclones and ridges arrive, the height of inversions does not exceed 2 km. (For Russian original see I-5044)

I-10961
Babarykin, V.K. , Beliaev, V.P.
STUDY OF ATMOSPHERIC TURBULENCE IN ANTARCTICA BY RADIOSONDES. Antarctic (Antarktika), 1971, p.115-123, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 6 refs.

Temperature, pressure, and humidity measurements were made simultaneously using radiosondes at Mirnyy Station in Sept., Oct., and Dec., 1963, at 0000 and 1200 hr. The frequency of turbulence per kilometer, its mean-monthly variation with height, and the turbulence distribution relative to the tropopause and level of maximum wind speed are calculated. The turbulence shows two maxima: between 6.5 and 11.5 km (63 per cent), related to the tropopause and the maximum wind velocity, and at 21 km (54 per cent), possibly related to a secondary wind maximum. High turbulence is distributed symmetrically to the axis of a stratospheric jet stream, with calmer winds on the axis. Turbulence in the lower troposphere is evidently related to dynamic, rather than thermal, factors. (For Russian original see I-5045)

I-10962
Dolgin, I.M. , Shiposh, N.V.
DISTRIBUTION OF AIR DENSITY OVER ANTARCTICA. Antarctic (Antarktika), 1971, p.124-135, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 4 refs.

Data on atmospheric density are analyzed for Mirnyy, Vostok, Amundsen-Scott, Ellsworth, Hallett, and McMurdo Stations. The results show that at the isobaric surfaces the maximum mean-monthly values are observed from June to Sept. in the troposphere, and in Aug. and Sept. in the stratosphere. Minimum values are observed in Dec. and Jan. in the troposphere, and from Dec. to Feb. in the stratosphere. A vertical profile above the continent, showing isopicnals and isotherms, permits a comparison of the latitudinal distribution of density at various altitudes. The monthly density values to an altitude of 26 km above Mirnyy Station are graphed. An evaluation is made of the effect of pressure and temperature factors of the atmospheric density above Mirnyy. Vertical gradients are graphed in the form of isolines. (For Russian original see I-5046)

I-10976
Bugaeva, I.V.
LOCATION OF THE VELOPAUSE OVER ANTARCTICA. Antarctic (Antarktika), 1971, p.185-192, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 1 ref.

The velopause is defined as the upper edge of the transitional layer in the middle stratosphere, which separates the anticyclonic eastern wind conditions above from the western winds below. Over the Arctic it is found at an altitude of 15-16 km when the stratospheric circumpolar anticyclone development is at its maximum; in the summer it may drop as low as 11-12 km and, by Sept., it is higher than the 25-30 km limit of radiowind sounding. Radiosonde investigations of these conditions in the Southern Hemisphere were conducted during the summer seasons at Mirnyy from 1956 to 1962 and at Vostok from 1958 to 1961. A table shows the average altitudes of the velopause for each month in which the eastern wind pattern was low enough to be measured by radiosonde, that is, from the end of Nov. through the end of Feb. At Mirnyy its altitude fluctuated from 18.5 to 24 km, 2 km higher than at the corresponding Arctic latitude; at Vostok it was rather stable and averaged 16.0-

16.5 km, approximately the same as at the corresponding Arctic latitude. These results are considered to be tentative; the difficulty of determining the velopause position under certain weather conditions is illustrated by 2 vertical sections showing wind speeds and directions during periods of cyclonic activity. For Russian original see I-4547.

I-10984
Bardin, G.I. , Zhdanov, L.A., Evseev, V.V., Milashenko, G.P., Nezhenkin, V.I.
USE OF SATELLITE INFORMATION IN ANTARCTICA. Ispol'zovanie sputnikovoi informatsii v Antarktide. Meteorologiia i gidrologiia, 1972 No.1, p.109-112, In Russian.
QC851.M27
Preliminary results are reported of using satellite information by the weather unit of the 15th Soviet Antarctic Expedition in 1969-1970 at Mirnyy Station to predict weather and sea ice conditions at different Antarctic stations. Charts were compiled from satellite photographs and data obtained from the air force, navy, and Antarctic stations. Forecasting data were also used by the expedition ships and the whaling fleet for navigation.

I-10985
Chuprina, V.I.
FEATURES OF TROPOPAUSE FORMATION OVER THE POLAR REGIONS. Ob osobennostiakh formirovaniia tropopauzy nad poliarnymi raionami. Meteorologiia i gidrologiia, 1971 No.11, p.38-42, In Russian with English summary. 29 refs.
QC851.M27
A literature survey on the position of the tropopause over the Arctic and Antarctic is summarized. Comparison of temperature data for the polar regions shows that at 850-700 mb at the latitudes below 70 deg the temperature is lower in winter and higher in summer in the Northern Hemisphere, due to the variation in heating and cooling phenomena caused by the continents and oceans. Tropopause height over Arctic stations varies from 8.6 to 9.2 km in Jan. and from 9.6 to 9.8 km in July. Over Antarctic stations the tropopause height is 10.4 km in July, and from 8.2 to 8.6 km in Jan. Formation in the polar regions of the advective tropopause occurs in winter, while the local tropopause forms in summer.

I-11020
Galvally, I. , Allison, I.
OZONE FLUXES OVER SNOW SURFACES. Journal of geophysical research, July 20, 1972 77(21), p.3946-3949, 8 refs.
QC811.J6
Measurements of ozone differences between two heights in the vertical and the derived ozone fluxes above snow surfaces are presented. Comparison is made of measurements over old snow surfaces at Mt. Buller, Victoria and Mawson, Antarctica, and new snow surfaces at Mt. Buller. Old snow surfaces have an ozone destruction rate of <8x10 exp 10 molecules per sq cm per sec, which is much slower than the destruction rate for a soil or vegetation surface. More complicated ozone exchange processes are observed above fresh snow surfaces.

I-11027
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA. GOUGH (0130 SAST) 1969. Pretoria, [1970], 142p., Tabular data.
DAS, MO6.7/68 S726ra
The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station on Gough I. are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-11028
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA. GOUGH (1330) 1969. Pretoria, [1970], 119p., Tabular data.
DAS, MO6.7/68 S726ra
The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station on Gough I. are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adapted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-11079
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA. SANAE 1964. Pretoria, 1966, 142p., Tabular data.
DAS, MO6.7/68 S726ra
The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station at SANAE Station are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adopted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-11084
South Africa. Weather Bureau
RADIOSONDE RAWIN DATA. SANAE 1965. Pretoria, 1966, 157p., Tabular data
DAS, MO6.7/68 S726ra
The daily values and monthly means of checked data obtained from the Radiosonde/Rawin ascents at the South African Weather Station at SANAE Station are tabulated. The layout and contents conform, as far as possible, with Resolutions and Recommendations adopted by the Executive Committee of the WMO. The data include the day, South African standard time, surface synoptic weather, present weather and pressure tendency, surface pressure, temperature, dew point, wind direction, wind speed, height of constant pressure levels, pressure of significant levels, heights of tropopause levels, and mean values.

I-11089
Rikhter, G.D.
CLIMATIC ROLE OF SNOW COVER.
Klimatoobrazuiushchaia rol' snezhnogo pokrova. Geograficheskoe obshchestvo SSSR. Zabaikal'skii filial. Izvestiia, 1970 6(4), p.44-48, In Russian.

Studies on the effect of the snow cover on climate in cold regions, including the Antarctic, show that the cover increases air transparency and solar radiation. Due to the low pollution and low humidity in the Antarctic 80-82 per cent of the radiation reaches the surface. Since snow has exceptional reflecting and radiative properties, severe cooling of the snow cover and adjacent air layer occurs. Seasonal variation of the snow-cover area causes changes in the atmospheric circulation, which effects all meteorological phenomena.

I-11105
Schulze, B.R.
CLIMATE OF MARION ISLAND. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.16-31, 17 refs.
QH199.5.S68

Marion I., situated within the southern circumpolar ocean, is dominated by an unending succession of extra-tropical cyclones with their attendant cloudy skies, abundant precipitation, and strong westerly winds. Yet, within this macro-climate the island, notwithstanding its insignificant mass when compared to the vast ocean, creates its own meso-climate by virtue of its configuration and due to its physical properties differing from those of water. This meso-climate is characterized by definite diurnal variations perceptible in all surface climatic elements.

I-11176
Unthank, E.L.
STRATOSPHERIC WINDS AND WINTER WARMINGS IN THE SOUTHERN HEMISPHERE. Nature physical science, Aug. 14, 1972 238(85), p.109-111, 11 refs.
Q1.N22

Comparison of temperatures, horizontal temperature gradients, and wind parameters at Laverton, Australia and at Macquarie Island, Antarctica showed consistently high negative correlations between the 20 mb temperatures of Macquarie Island and the 100 kfoot zonal winds at Laverton. Low 20 mbar temperatures at Macquarie Island correlate highly with 100 k foot westerly winds at Laverton and high 20 mbar temperatures at Macquarie Island with 100 kfoot easterly winds at Laverton This result and the almost-one-for-one correspondence between reported southern hemispheric stratospheric warmings and zonal flow reversals at Laverton before and during these years, suggest that 100 kfoot winds at Laverton might be used as an indicator of warmings at the higher southern latitudes--a considerable advantage because the data network at these higher latitudes is so sparse.

I-11189
South Africa. Weather Bureau
MONTHLY MEAN TEMPERATURE AND SEA-LEVEL PRESSURE AT NORWAY STATION/SANAE SINCE 1960. South African journal of antarctic research, 1971 No.1, p.33

Monthly mean temperatures and sea-level pressures obtained at Norway Station and SANAE Station since 1960 are given in tabular form. The data are published in greater detail in the Report of the Year series of the Weather Bureau. Future issues of this journal are to contain regular installments of the monthly and long-term data from the South African Antarctic and island stations.

I-11228
Dezerega C., V.
ANTARCTIC METEOROLOGICAL CENTER AT PRESIDENTE FREI STATION. El Centro Meteorológico Antártico de Base Presidente Frei. Instituto Antártico Chileno. Boletín, 1969 No.4, p.35-36, In Spanish.

The Centro Meteorologico Antartico at President Frei Station was inaugurated to aid the analogous American (McMurdo) and Soviet (Molodezhnaya) centers in processing meteorological information on Antarctica and in predicting weather for the Southern Hemisphere. The first phase has been completed with the construction of a 20-man station with 120 kw of electrical potential. In the future radio communication facilities will be improved, a meteorological satellite data reception station will be installed, and a link with the World Center at Melbourne will be set up.

I-11231
Koshel'kov, IU.P.
STRUCTURE AND CIRCULATION OF THE UPPER ATMOSPHERE OVER THE EASTERN ANTARCTIC IN 1969-1970. Stroenie i tsirkuliatsiia verkhnei atmosfery nad Vostochnoi Antarktikoi v 1969-1970 gg.. Meteorologiia i gidrologiia, May 1972 No.5, p.93-96, In Russian. 11 refs.
QC851.M27

Temperature and wind regime in the upper atmosphere was studied by using data obtained from meteorological rockets at Molodezhnaya Station from July 1969 to Dec. 1970 and on Kerguelen Is. from Jan. to Dec. 1970. The results of meteorological observations in the Southern Hemisphere were analyzed and are compared to those in the Northern Hemisphere.

I-11267
Chesselet, R. , Morelli, J., Buat-Menard, P.
VARIATIONS IN IONIC RATIOS BETWEEN REFERENCE SEA WATER AND MARINE AEROSOLS. Journal of geophysical research, Sept. 20, 1972 77(27), p.5116-5131, 37 refs.
QC811.J6

Atmospheric particles were collected over the open sea (western Mediterranean, North Atlantic, Norwegian Sea and Antarctic Ocean) by air filtration and cascade impactor sampling. The observed K/Na concentration ratios exhibited marked variation and were greater than the reference ratio in bulk sea water. These concentration ratios can be related to the existence of a chemical fractionation affecting the marine aerosols produced by bubbles bursting at the sea surface. The presence of terrigenous dust in the samples raises questions as to the validity of the fractionation hypothesis. In strong support of this fractionation concept are data based on (a) laboratory and in situ experiments with artificially produced aerosols; (b) high-volume air sampling over the Antarctic Ocean with controlled low loads of hydro-insoluble dust; and (c) coastal region sampling where silicon, aluminum, iron, and potassium provide a corrective index for potassium-rich terrigenous dust concentrations. K/Na, Ca/Na, and Mg/Na ratios observed in ice from the central part of the East Antarctic Plateau and corrected for a terrigenous influence with the iron index, suggest a geochemical fractionation at the marine source. These data further suggest that

fractionated marine aerosols can be transported far from their place of origin.

I-11274
Clarke, R.H. , Strickler, R.F.
SOUTHERN HEMISPHERE PREDICTION EXPERIMENT WITH A NINE-LEVEL PRIMITIVE-EQUATION MODEL. Monthly weather review, Aug. 1972 100(8), p.625-636, 26 refs.
QC983.A2

A nine-level hemispheric primitive-equation model is applied to make a 14-day experimental prediction for the Southern Hemisphere: this is the first numerical prediction on the hemispheric scale for the Southern Hemisphere and the first attempt to use the model for summertime forecasting. The predictions are verified against hemispheric data, the inadequacy of which is clear. They are also verified in the Australasian sector where the data are more adequate. A further test of the model is its ability to reproduce the well-known vertical circulation over Antarctica and its katabatic winds. The katabatic outflow with anticyclonic circulation is reproduced in the model, but its depth is probably underestimated. Some properties of the model atmosphere are compared with those of the observed Southern Hemisphere atmosphere, and deficiencies in the performance of the model, as well as in the analysis and initialization, are brought out by the comparison. However, on the whole, good agreement is found

I-11279
Dezerega C., V.
DEVELOPMENT OF ANTARCTIC ATMOSPHERIC SCIENCE IN CHILE. Desarrollo de las ciencias atmosféricas antárticas en Chile. Instituto Antártico Chileno. Boletín, 1970 No.5, p.17-18

Chile conducts an intensive annual gathering of meteorological data of synoptic interest from Antarctica. It is processed by the Oficina Meteorologica de Chile and published by INACH. The Centro Meteorologico Antartico at President Frei Station was recently set up to aid in weather prediction and the collection of data. Various universities have programs for the study of solar energy, cosmic radiation, the ionosphere, etc. Because of logistical and monetary difficulties, it will not be possible to complete a polar observatory before 1980.

I-11289
Serlapov, S.T.
RESULTS OF STUDYING WEATHER CONDITIONS IN POLAR REGIONS. Itogi izucheniia pogodnykh uslovii poliarnykh oblastei. Problemy Arktiki i Antarktiki; Sbornik statei, 1972 Vol.39, p.63-72, In Russian. 38 refs.
G575.L422

Main features of the atmospheric processes in the Arctic and Antarctic based on data from previous meteorological studies, including satellite information, are discussed. The results show more distinct zonation of the mean annual surface pressure field and the atmospheric circulation in the Southern than in the Northern Hemisphere. The surface pressure field in the Southern Hemisphere is divided into three circular zones: 1) high pressure subtropical belt from 20 to 40-43S with localized crests, tops of which stretch up to 60S and beyond; 2) low-pressure coastal- and sub-Antarctic belt with high activities of cyclones, which move in both circular and meridional paths; and 3) continental anticyclone zone at the Pole of Relative Inaccessibility. In 50 per cent of the cases, antarctic anticyclones, reach 500 mb and in 25 per cent, up to 300 mb. Another feature of the antarctic surface-pressure field is the quasi-static polar depression in the South Pacific Ocean and the Ross Sea at 500, 300 and 200 mb. Polar distribution of ozone, one of the most effective atmospheric reagents of solar activity in winter, is analyzed in relationship with processes occurring in the upper and low atmosphere.

I-11290
Diubkin, I.A. , Tsigel'nitskii, I.I.
VARIATIONS IN THE MEAN MONTHLY TEMPERATURE OF THE SURFACE AIR LAYER IN EAST ANTARCTICA. Ob izmenchivosti srednemesiachnoi temperatury v prizemnom sloe vozdukha Vostochnoi Antarktidy. Problemy Arktiki i Antarktiki; Sbornik statei, 1972 Vol.39, p.90-95, In Russian. 6 refs.
G575.L422

Results of the mean monthly air temperature in the surface layer obtained at 8 stations of the coastal and inner parts of East Antarctica during various periods of time, from 5 to 12 yrs, were analyzed. Data on the mean values of monthly temperatures at the stations were graphed, and data on the variations between maximal and minimal values of temperatures were tabulated. It was concluded that the atmospheric temperature in the coastal climatic zone undergoes significant fluctuations, indicating intensive atmospheric processes. The highest stability of the air temperature occurs in the Molodezhnaya region, while the lowest occurs in the Wilkes region. A hypothesis, that the stability of the mean monthly air temperature is greater in the central part of the continent than on the coast line, was not confirmed.

I-11330
Tricker, R.A.F.
OBSERVATIONS ON CERTAIN FEATURES TO BE SEEN IN A PHOTOGRAPH OF HALOES TAKEN BY DR. EMIL SCHULTHESS IN ANTARCTICA. Royal Meteorological Society, London. Quarterly journal, July 1972 98(417), p.542-562, 13 refs.
QC851.R8

A more complete theory than has been available before of the Lowitz arc and its associated upward pointing companion, is given. The formation of the arc of Lowitz, which passes through the 22 deg mock sun and is tangential to the halo at a point of lower elevation was correctly attributed by Hastings (1920) to refraction in hexagonal ice crystal plates which spin, or are randomly distributed, about a diagonal which is maintained horizontal during fall through the atmosphere. The theory of the supralateral arc to the halo of 46 deg is given and it is shown that, at least in the case of the halo photographed, the suggestion put forward by Hastings about the nature of the halo of 46 deg is untenable. It follows that his explanation of the arcs of contact to this halo must also be revised. Alternative explanations are put forward.

I-11331
Hisdal, V.
DIURNAL WIND VARIATIONS IN ANTARCTICA. Royal Meteorological Society, London. Quarterly journal, July 1972 98(417), p.673-680, 3 refs.
QC851.R8

For the three Antarctic ice shelf stations considered (Norway Station, Maudheim, and Halley Bay) it is shown that from spring to autumn a

systematic diurnal variation of the mean vector wind at the surface exists. Different factors that may be responsible for this variation are discussed. The results seem to agree well with the assumption that in areas far from the ice front (the seaward edge of the ice shelf) the main cause is the larger net gain of momentum in the lowest layers during the middle of the day, while closer to the ice front there is an additional effect of the varying contrast between the air temperature over the sea and over the ice shelf. (Auth.)

I-11332
Zillman, J.W. , Price, P.G.
THERMAL STRUCTURE OF MATURE SOUTHERN OCEAN CYCLONES. Australian meteorological magazine, Mar. 1972 20(1), p.34-48, 22 refs.
QC851.A86

A model of the thermal structure of Southern Ocean cyclones generalized from aerological soundings through characteristic vortex-associated cloud features is presented. The idealized patterns of sea-air temperature difference, mixed layer depth, tropopause pressure and thermal anomaly fields on several constant-pressure surfaces are judged to be fairly representative for the region between about 40 deg S and the pack-ice limits for all seasons but the magnitudes are strictly applicable only to the Oct.-Nov.-Dec. period from which most of the basic data were taken. (Auth.)

I-11334
Troup, A.J. , Streten, N.A.
SATELLITE-OBSERVED SOUTHERN HEMISPHERE CLOUD VORTICES IN RELATION TO CONVENTIONAL OBSERVATIONS. Journal of applied meteorology, Sept. 1972 11(6), p.909-917, 10 refs.
QC851.A66

A classification scheme for cloud vortices recorded on hemispheric digital mosaics southward of 20 S during a period of some 550 days is used to construct models based on observations of associated atmospheric structure. Such models for various vortex types are expressed in terms of anomaly patterns of surface pressure, and 500- and 300-mb geopotential. Hopefully such models may find application in the development of analysis techniques over the data-void regions of the hemisphere. Data for Gough and Macquarie Is. were used in the analysis. (Auth. mod.)

I-11387
Biter, C.J.
AVIATION CLIMATOLOGY OF PALMER STATION, ANTARCTICA. Norfolk, Navy Weather Research Facility, July 23, 1965, 40p., Unpublished manuscript. 4 refs.

An aviation climatology of the summer season at Palmer Station is presented to be used by COMNAVSUPPFOR ANTARCTICA for planning purposes in carrying out their responsibility of supporting the United States scientific programs in Antarctica. The records of four nearby weather reporting stations (Melchior, Almirante Brown, Port Lockroy, and the Argentine Islands) have been used to approximate the climatology of Palmer Station, for which no weather records have been available. The weather statistics appear to be relatively stable from one station to the next; thus, the data from the four stations can be extrapolated to Palmer Station with some degree of confidence.

I-11389
Craig, C.L.
METEOROLOGICAL ROCKET PROBES OF THE UPPER ATMOSPHERE IN THE ANTARCTIC. University of Texas at El Paso, Apr. 1968, 15p., 6 refs.

Stratospheric circulation studies in the Antarctic have enlarged the data on 1) "sudden warming effects" or "temperature explosions"; 2) time of the summer stratospheric circulation change-over (a time when the stratospheric wind changes from westerlies to easterlies, due to the fact that the polar temperature reverses from being colder at higher latitudes to being colder at lower latitudes); 3) rapidity with which this change-over occurs; 4) seasonal variations of the stratospheric wind and temperature; 5) contribution that the Antarctic circulation makes to the general global pattern; 6) comparisons between the Arctic and Antarctic wind and temperature regimes.

I-11407
Duran, H.
INFORMATION ON STUDIES OF THE METEOROLOGIST HUGO DURAN IN THE AMERICAN OCEANOGRAPHIC VESSEL "ELTANIN". Informe sobre estudios efectuado por el meteorológo Dn. Hugo Duran en el buque oceanográfico norteamericano "Eltanin". Santiago, Chile, Oficina Meteorológica de Chile, 1965, 15p., In Spanish. Unpublished manuscript.

Along with meteorological data from Eltanin investigations along the coast of Chile and in New Zealand, general information on US bases in Antarctica and their scientific programs is given.

I-11446
Burdecki, F.
APERIODIC FLUCTUATIONS OF METEOROLOGICAL ELEMENTS AT SANAE, QUEEN MAUD LAND, ANTARCTICA. Unperiodische Schwankungen der meteorologischen Elemente in Sanae, Queen Maud Land, Antarctica. Polarforschung, Nov. 1971 Ser. 7, 41(1/2), p.121-126, In German. 8 refs.
G600.P6

The author presents data in a table and graphs on the extreme monthly values of atmospheric temperature, wind speed, and atmospheric pressure at SANAE (South African National Antarctic Expedition) Station for the period 1960-1969; and also on the monthly means of temperature, wind velocity, and frequency of calm at SANAE from the 5-yr mean of 1963-1967. The existence of significant long period deviations in temperature, wind velocity, and frequency of calm is demonstrated. Deviations in individual years are discussed briefly.

I-11456
Gaevskaia, O.V.
PHOTOGRAPHS OF CLOUD COVER OVER ICE, OBTAINED FROM "METEOR" SATELLITES. Izobrazhenie oblachnosti nad l'dom na televizionnykh snimkakh, poluchennykh so sputnikov sistemy "Meteor". Antarktika; doklady komissii, 1969, pub. 1971, p.122-128, In Russian.
G576.A65

On the basis of cloud photographs obtained by the "Meteor" satellites in the Arctic and Antarctic during the spring-summer period, characteristics of clouds and sea ice are described. Some differences found in TV pictures to differentiate cloud patterns over sea ice from sea ice are discussed.

I-11490
Frakes, L.A. , Kemp, E.M.
INFLUENCE OF CONTINENTAL POSITIONS ON EARLY TERTIARY CLIMATES. Nature, Nov. 10, 1972 240(5376), 33 refs.
Q1.N2

The climates of the Earth in the later half of the Eocene (40-48 m.y. ago) and in the early half of the Oligocene (30-37 m.y. ago) are modeled based on a reconstruction of the continents in the Cainozoic determined by means of rock magnetism and seafloor spreading data. The Eocene configuration, using seafloor data, shows a very wide Indopacific Ocean (spanning about 210 deg at the equator), a narrow Atlantic, a south polar landmass probably connecting to South America and separated from Australia by a narrow seaway, and Pakistan-India astride the equator. By the middle of the Oligocene the equatorial Pacific had been narrowed substantially, concurrently with the widening of the Australia-Antarctic seaway, as a result of the northward motion of Australia-New Guinea. Also, the South America-Antarctica join appears to have been interrupted by formation of the Scotia arc, though this conclusion must be tentative because the positions for Antarctica are based on seafloor spreading data alone. On the basis of these data and circulation patterns of surface currents in the world ocean, the suggested trends in global climate appear to have been warm and wet in the late Eocene, becoming slightly cooler and drier in the Oligocene.

I-11540
Pagotzkie, R.A.
SUMMER WEATHER PATTERN OF THE WRIGHT VALLEY. Madison, University of Wisconsin, 1963, 6p., Unpublished manuscript.

Climatic factors affecting Wright Valley, an ice-free valley between the Upper Wright and Wilson-Piedmont blaciers, are examined, based on observations made between Nov. 15, 1962 and Jan. 1, 1963. The summer weather pattern is controlled primarily by solar radiation, the valley's absorption rate being three times that of the snow-covered ice sheet on the neighboring plateau. Humidity was very low because of radiational heating, adiabatic heating of air flowing down from the plateau, and a lack of water (as ice) for evaporation. The summer climate is characterized by relatively high air temperatures, very low humidity, and net incoming radiation. The weather log of a typical summer day and significance to helicopter operations are included.

I-11546
Martin, D.W.
SATELLITE STUDIES OF CYCLONIC DEVELOPMENTS OVER THE SOUTHERN OCEAN. University of Wisconsin, 1968, 144p., Unpublished thesis for Ph.D. Refs. p.138-144.

Cyclones over the Southern Ocean have been investigated by means of conventional and Nimbus II satellite data. It was found that while Southern Ocean cyclones are remarkably varied in their size and behavior, there is no evidence for any fundamental differences between these and northern hemisphere systems. A technique, based on a cloud classification scheme, was devised for inferring vertical profiles of temperature, moisture, and wind from cloud patterns in satellite photographs of the Southern Ocean area. (Auth., mod.)

I-11580
Behar, J.V. , Zafonte, L., Cameron, R.E., Morelli, F.A.
HYDROCARBONS IN AIR SAMPLES FROM ANTARCTIC DRY VALLEY DRILLING SITES. Antarctic journal of the United States, July-Aug. 1972 7(4), p.94-96, 4 refs.
G845.A56

The results of hydrocarbon analyses of air samples collected at McMurdo Station, the Lake Fryxell camp in Taylor Valley, the Don Juan Pond camp in Wright Valley, and the Lake Vida camp in Victoria Valley are given. Three special collections were made -- of jet helicopter exhaust, and of rural and urban areas in New Zealand. The results indicate that the atmospheric environment of the Antarctic Continent is still relatively unencumbered by hydrocarbons of anthropogenic origin. The average values for the C2 hydrocarbons, ethane, ethene, and acetylene, are 0.7, 0.7, and 0.2 parts perbillion, respectively. The New Zealand samples will be compared with samples from urban and rural areas of Southern California.

I-11600
Sanak, J.
ATMOSPHERIC RADON MEASUREMENTS AT MCMURDO AND SOUTH POLE STATIONS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.120-121, 3 refs.
G845.A56

Radon-222 and radon-220 concentrations were monitored at McMurdo Station from Nov. 1971 to Feb. 1972 with an automatic device that measures the alpha-radioactivity of atmospheric dust, and at Amundsen-Scott Station with a manual device during the last half of Dec. 1971. Lead-210 (a solid decay product of the radon-222) is used as a natural atmospheric tracer for the air exchanges between the stratosphere and the troposphere as well as between the Northern and Southern Hemispheres. Study of the variation of lead-210 concentrations in an antarctic ice core enables computation of the rate of snow accumulation and to date each layer down to approximately 80 years ago. Snow samples were collected at the South Pole to measure the concentration of several elements by chemical or radioactivation techniques.

I-11602
Hofmann, D.J. , Rosen, J.M., Kjome, N.T.
MEASURING SUBMICRON PARTICULATE MATTER IN THE ANTARCTIC STRATOSPHERE. Antarctic journal of the United States, July-Aug. 1972 7(4), p.122-123
G845.A56

Data on the stratospheric aerosol soundings made by a balloon-borne aerosol detector near the North Pole in Dec. 1971 and at Amundsen-Scott Station in Jan. 1972 were studied and summarized. A schematic diagram of the detector is given and its operation is discussed. The instrument can detect particles down to a diameter of about 0.25 micron. The results obtained from Amundsen-Scott Station suggest a very clean troposphere at 2,912 m above sea level with the concentration down around one particle per cu cm; the polar stratosphere is comparatively clean, with one to two particles per cu cm.

I-11639
Poltaraus, B.V.
ZONAL AND SEASONAL FEATURES OF DIFFUSE SOLAR RADIATION. Zonal'nye i sezonnye osobennosti v prikhode rasseiannoi solnechnoi radiatsii. Meteorologiia i gidrologiia, Oct. 1972 No.10, p.62-69, In Russian with English summary. 21 refs.

QC851.M27

The paper considers for the first time monthly and annual diffuse solar radiation in different latitudinal zones of the globe, including Antarctica. The relationship is determined between diffuse and total solar radiation which changes during the year and depends on latitudinal zones. The characteristic variation is given of the radiation influx, using the mean and extreme sums of diffuse radiation for separate localities related to various climates.

I-11688
Rockney, V.D.
NOAA'S METEOROLOGICAL PROGRAM IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.168-169
G845.A56

During the 1971-1972 season, the NOAA meteorological program at Amundsen-Scott Station consisted of surface synoptic weather observations; rawinsonde observations; monitoring of upper-air weather conditions related to explosive stratospheric warming; exposure of special filters in a calibrated airstream for later analysis of radioactive debris; collection of air samples for CO2 analysis; and measurement of atmospheric turbidity. A new feature of the program was the use of a minicomputer for evaluation of upper-air weather data. Continuous measurement at the surface of five radiation parameters and atmospheric ozone observations were carried out by a member of NOAA's Environmental Research Labs. At Byrd Station surface weather observations were made.

I-11689
Riordan, A.J.
ATMOSPHERIC STABILITY AT PLATEAU STATION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.169-170, 2 refs.
G845.A56

Analysis of the 1967-1968 micrometeorological tower data from Plateau Station is nearing completion. The comprehensive record of temperature and wind structure during conditions of extreme stability provides the basis for an understanding of some unique natural features of the lower atmosphere over a uniform snow surface. Mean temperature profiles and mean hodographs for different stabilities illustrate interesting cases of uninterrupted strong stability at Plateau Station during the sunless period of 1967 (Apr. 25 through Aug. 20). There is increasing evidence that eddy diffusion occurs contrary to the temperature gradient during strong inversion conditions. Features of the inversion structure are being investigated.

I-11690
Miller, S. , Schwerdtfeger, W.
ICE CRYSTAL FORMATION AND GROWTH IN THE WARM LAYER ABOVE THE ANTARCTIC TEMPERATURE INVERSION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.170-171, 2 refs.
G845.A56

A substantial fraction of the total precipitation on the antarctic plateau is a result of ice crystal fall. The mean accumulation observed at Plateau Station for 23-29 days per month for 5 winter months amounted to 1.2 cm/mo. Most ice crystals form in the warm, nearly isothermal layer above the inversion layer where specific humidity is greater. Most of the crystal fall is composed of terminated columnar prisms (bullets) of the order of 500 by 100 microns. Growth time is computed as a function of temperature and supersaturation over ice. Total ice crystal production is estimated as slightly greater than 1 g/sq cm/yr.

I-11691
Gladney, E.S. , Zoller, W.H., Duce, R.A., Jones, A.G.
VANADIUM, ALUMINUM, AND MANGANESE IN ATMOSPHERIC PARTICULATES FROM MCMURDO AND SOUTH POLE STATIONS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.171-173, 6 refs.
G845.A56

Concentrations of trace elements in particulates are reported for samples taken at McMurdo and Pole stations during Nov. and Dec. 1970 and analyzed by neutron activation. The concentrations are compared with those in crustal material, urban pollution aerosols, and the sea in an effort to determine the sources of the particulates. Data are included from Hawaii and Boston, Mass. The concentrations at Pole Station were the lowest obtained in the Antarctic. Furthermore, these concentrations are much lower than those reported for windward Hawaii, which is representative of midoceanic air. A high vanadium-to-aluminum ratio relative to the earth's crust was noted which could be due to vanadium from pollution aerosols as is the case in Boston, and perhaps in Hawaii, or due to crustal sources that have a higher vanadium-to-aluminum ratio than reported in the literature.

I-11747
Australia. Bureau of Meteorology
METEOROLOGY: MACQUARIE ISLAND, MAWSON AND WILKES, 1966. Australian National Research Expeditions. Publication, 1969 No.109, ANARE data reports. Series D (19) Meteorology, 375p.
G845.A8

This volume contains surface, radiosonde, and upper wind observations made at Macquarie I., Mawson, and Wilkes during 1966. The details are presented as listings and in the form of cumulated frequency analyses. The climatological summary presents the surface monthly means of selected meteorological variables tabulated at 3-hourly intervals from the results of surface observations.

I-11752
CONTINUING METEOROLOGY ON THE ICE. American Meteorological Society. Bulletin, Oct. 1972 53(10), p.1010
QC851.A6

Continuing meteorological programs in Antarctica include those on aurora/airglow; ionospheric sounding; basic climatology; solar radiation; atmospheric turbidity measurements; atmospheric potential gradient measurements; and synoptic weather observations. Earth-orbiting satellites, particularly ESSA-8 and Nimbus-4, are used to a large extent for weather observations. Programs planned for the 1972-73 season include measurement of submicron particulate matter in the antarctic stratosphere at McMurdo and South Pole stations; continuation of the study of trace metals and halogens in the atmosphere at South Pole station; and a polar auroral radar program during which an attempt will be made to locate the auroral poles. Geophysical observations will continue at McMurdo Station, and magnetospheric and ionospheric investigations concentrating on the plasmapause will be carried out at Siple station and its geomagnetic conjugate, Roberval, Quebec, Canada.

I-11754
U.S. Environmental Data Service
CLIMATOLOGICAL DATA FOR SELECTED U.S. ANTARCTIC STATIONS. NO.11, JANUARY 1969-DECEMBER 1970. Asheville, N.C., 1972, 106p.
QC994.9.U6

Conventional surface weather elements for Amundsen-Scott and Byrd Stations were recorded at 3- and 6-hourly intervals. Peak wind speeds were recorded by both stations. Average monthly surface temperatures were obtained by using all available hourly type observations, and average annual temperatures were computed from the sum of the monthly averages. Extreme surface temperatures were taken from summary of the day data, thereby indicating true absolute values. Byrd Station was closed Mar. through Sept. 1970 and reopened in Oct. 1970.

I-11809
Ageta, Y. , Fukushima, Y.
SURFACE METEOROLOGICAL DATA OF THE MIZUHO PLATEAU-WEST ENDERBY LAND AREA, EAST ANTARCTICA, 1969-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.135-167

During the periods of the oversnow traverses by JARE 10 and 11, surface meteorological observations were carried out several times a day on air temperature, direction and speed of wind, atmospheric pressure, weather condition, type and amount of clouds and surface visibility. The data were sent to Showa Station by radio once a day, then to the World Meteorological Centers.

I-11812
Labitzke, K. , Barnett, J.J.
GLOBAL TIME AND SPACE CHANGES OF SATELLITE RADIANCES RECEIVED FROM THE STRATOSPHERE AND LOWER MESOSPHERE. Journal of geophysical research, Jan. 20, 1973 78(3), p.483-496, 20 refs.
QC811.J6

The annual progression of radiances received with channels A and B of the selective chopper radiometer is discussed, emphasis being on the differences between the northern and southern winters. Major midwinter warmings, leading to a breakdown of the stratospheric circulation, took place only in the northern hemisphere, where in turn they were followed by a second cooling in late winter. In the uppper south polar stratosphere and lower mesosphere, the minimum of radiances was reached in early winter. A steady warming began immediately after this minimum and led to a reversed meridional temperature gradient (final warming) about two months earlier than over the arctic. Because of this difference, the upper stratosphere and lower mesosphere over the antarctic were as warm as or warmer than those of the arctic outside the period of the northern midwinter warming. Midwinter radiance changes over both polar regions are coupled with changes of opposite sign in the subtropics and tropics of both hemispheres.

I-11858
Lamb, H.H. , Bromley, R.G.
CUMULUS AND CUMULONIMBUS CLOUDS IN HIGH LATITUDES: SOME GREENLAND PICTURES. Weather, Nov. 1972 27(11), p.474-475, 2 refs.
QC851.W4

Contrary to many statements in the older literature that only stratiform cloud types occur in the polar regions, cumulus and cumulonimbus clouds have been observed in Antarctica and in Greenland. On Mar. 8, 1947, cumulonimbus clouds were observed over the coastal mountains of Antarctica near 112-113 E. Over the surrounding ocean cumulus and cumulonimbus types were common in cold outbreaks. Both types were observed on 35 out of 150 days spent south of 50 S. Photographs of cumuli in various parts of Greenland are presented.

I-11859
Gauntlett, D.J. , Seaman, R.S., Kininmonth, W.R., Langford, J.C.
OPERATIONAL EVALUATION OF A NUMERICAL ANALYSIS-PROGNOSIS SYSTEM FOR THE SOUTHERN HEMISPHERE. Australian meteorological magazine, June 1972 20(2), p.61-82, 11 refs.
QC851.A86

A general description is given of a numerical analysis-prognosis system which has been designed specifically for operational use over the southern hemisphere. In addition to comment regarding possible future development prospects, the results of a recent operational evaluation of the system are presented. The operational results are generally creditable and invite acceptance of system potential.

I-11860
Seaman, R.S.
STABILITY-TEMPERATURE CORRELATIONS AND THEIR APPLICATION TO OBJECTIVE ANALYSIS. Australian meteorological magazine, June 1972 20(2), p.83-103, 15 refs.
QC851.A86

Stability parameters for standard atmospheric layers between 500 and 100 mb, are statistically related with 500 mb temperature and latitude in the Australian sector of the Southern Hemisphere. Methods are described whereby these relations are used to generate guess fields of temperature and geopotential thickness above 500 mb for hemispheric and limited area objective analyses. Over areas where the only input data are 1000 to 500 mb thicknesses based on satellite cloud picture interpretation, analyses above 500 mb using the above methods usually appear synoptically reasonable, and overcome typical defects of other methods previously used. Data from Heard I., Macquarie I., and Wilkes and Mawson Stations were used in the development of stability-temperature correlations.

I-11932
Kombyr, W.D. , Grass, R.D.
OZONESONDE OBSERVATIONS 1962-1966. (VOLUME 2). U.S. Environmental Science Services Administration. ESSA technical report, Aug. 1968 ERL 80-APCL 3, 245p., 13 refs.

From 1962 through 1966, vertical distribution ozone measurements were made at 11 sites operated or supported by the Environmental Science Services Administration in the Western Hemisphere and in Antarctica. Observations made initially at several of the stations to provide information on instrument performance were followed by a major effort in data gathering during the International Quiet Sun Years (IQSY), 1964-1965. Results are presented in the form of ozonagrams displaying ozone and temperature profiles, from Antarctic stations for the years 1963 through 1966. (Auth., mod.)

I-11934
O'neal, J.M.
ANTARCTICA; A MOSAIC OF CLOUD-FREE SATELLITE PHOTOGRAPHS FROM ESSA III. U.S. Navy. Weather

Research Facility. NAVWEARSCHFAC technical paper, May 1968 No.9-68, 2p.

A cloud-free mosaic of the Antarctic continent has been prepared for the support of Operation Deep Freeze. The mosiac was constructed from individual ESSA 3 frames taken during the 1967 austral summer. The plastic overlay points out predominant geographical features and/or locations, U.S. stations, and the terrain features visible in the mosaic. These terrain features are numbered and an index is included for their identification.

I-11945
Zhukov, V.A. , Silant'ev, A.N., Zhdanov, L.A.
PRELIMINARY DATA ON THE EFFECT OF DRAINAGE WINDS ON THE RADIOACTIVITY OF THE AIR AT THE ANTARCTIC COAST. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.70-71, Translated from its Informatsionnyi biulleten', No.80, 1970. 4 refs.

Isotope composition of the air was analyzed in order to determine the effect of drainage wind on radiation levels. The relationship between stratospheric and tropospheric air masses is explored. The relative content of isotopes with different half-lives in day and night samples is explored for 12 isotopes. Preliminary results suggest a relationship between drainage wind and air masses in the lower layers of the stratosphere that contain "old" fission products with a long half-life. The radioisotope method makes it possible to distinguish air masses carried out by drainage and trace their origin.

I-11958
Vusik, D.P.
INSTALLATION FOR RELEASING RADIOSONDES FROM THE EDDY ZONE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.102-103, Translated from its Informatsionnyi biulleten', No.80, 1970.

An installation for experimental radiosonde releases in strong wind is described. It consists of a tower 115-20 m high, a 6 mm steel cable going from the top of the tower to the door of the generator building 40-50 m away, and a holding lock. A metal arrester plate against which the holding lock strikes is located 10-15 m from the tower to prevent the shell from hitting the tower and tearing. The radiosonde begins free ascent in the safety zone in a steady air stream 15-20 m above the ground.

I-11980
Loewe, F.
ON TROPOSPHERIC-STRATOSPHERIC COMPENSATION IN HIGH SOUTHERN LATITUDES. Zur troposphärisch-stratosphärischen Kompensation in hohen südlichen Breiten. Gerlands Beiträge zur Geophysik, 1972 81(3/5), In German with English summary. 8 refs.

In temperature latitudes the temperatures of the troposphere and stratosphere vary generally in the opposite sense; a tropospheric-stratospheric "compensation" exists. An extension of the study to high southern latitude shows that the compensation exists there too for daily temperature changes and temperature deviations in summer and for the mean of the whole year albeit in a less pronounced degree than in lower latitudes. The compensation might be related to the "null layer" of Faust. (Auth.)

I-11983
Streten, N.A. , Troup, A.J.
SYNOPTIC CLIMATOLOGY OF SATELLITE OBSERVED CLOUD VORTICES OVER THE SOUTHERN HEMISPHERE. Royal Meteorological Society, London. Quarterly journal, Jan. 1973 99(419), p.56-72, 16 refs.
QC851.R8

Over the data void Southern Hemisphere oceans satellite mosaic sequences enable some generalized synoptic climatological information to be obtained, and inferences to be made about large scale hemisphere circulation features. The development of depressions over the oceans may be tracked by their corresponding cloud pattern 'signatures', and mean numerical values of anomaly in conventional data reflect the three-dimensional evolution of the vortices. More than half the vortices developed in the absence of previously observed cloud bands. A high frequency of vortex development is observed along well defined axes which delineate the principal frontal zones of the hemisphere. A high frequency of decaying depressions is observed in particular longitudes close to Antarctica. The pattern of cyclonic formation and decay and the tracks of the systems tend to point to a high frequency of a basic 3 long wave pattern around the hemisphere. Such a pattern displays cyclogenesis east of South America associated with cyclolysis near Enderby Land, and further east; cyclogenesis from Kerguelen to southern Australia and cyclolysis near Adelie Land and the Ross Sea; and cyclogenesis in the central Pacific with cyclolysis in the Bellingshausen Sea.

I-12001
Phillpot, H.R.
SOME AUSTRALIAN ACTIVITIES ASSOCIATED WITH ANTARCTIC METEOROLOGICAL RESEARCH. Polar record, Sept. 1972 16(102), SCAR bulletin, No.42, Sept. 1972, p.513-515, 2 refs.
G575.P6

Australian meteorological research activities are centered in the Synoptic Research Branch of the Australian Bureau of Meteorology. The major activity of this group during the past two and one-half years was the Basic Data Set Project (DPSP): the preparation of two sets of global meteorological data required for the numerical experiments necessary to plan the First GARP Global Experiment (FGGE). The Global Atmospheric Research Programme (GARP) is designed to obtain an improved understanding of the physical processes of the general atmospheric circulation, to formulate improved physico-mathematical models of the atmosphere, and to prepare an optimum design for a global observing system.

I-12002
Rutherford, G.T.
WEATHER ANALYSIS IN THE ANTARCTIC. Polar record, Sept. 1972 16(102), p.515-519
G575.P6

The analysis/prognois output for the Southern Hemisphere has not yet reached satisfactory standards of quality, timeliness, or quantity of output. The lack of data from most of the hemisphere is largely responsible for deficiency in quality. Even at those stations equipped to conduct radiosonde observations, the restriction of these in most cases to one flight per day, in effect, extends the data sparse region over land as well as ocean areas. Lack of timeliness of the product is also a major deficiency. The WMC Melbourne output has not reached desired standards due to communication problems. Deficiencies in quantity of output derive mostly from developmental problems in numerical analysis modeling It may well be that

the objective of providing adequate analyses over the data sparse areas of the Southern Hemisphere, ie analyses that are not only vertically consistent but are realistic in the horizontal with regard to isotachs and isotherms, will not be achieved until accurate SIRS data are available operationally.

I-12004
Burdecki, F.
CLIMATE OF SANAE. PARTS 1 AND 2. Notos, 1969; 1970 Vol.18; 19, p.3-60; p.3-62, 78 refs.

Part I contains the analysis of surface temperature, wind and air pressure. Data of the 5-year period 1963 to 1967 has been accepted as the basis for the investigation. However, data of other years, as well as data of neighboring stations, such as Maudheim, Norway Station and Lazarev, and of distant stations, such as Dumont d'Urville and Little America, have been used. In part II interest is focussed mainly on the hydrometeorological elements, viz. the amount and variability of water vapor in the air and its relation to cloudiness, precipitation, wind, and temperature. The geophysical elements of sunshine, visibility, aurorae, and other optical phenomena are also discussed, as well as some interrelationships between particular climatic elements. A synopsis of the climatology in relation to the subantarctic atmospheric circulation and some remarks on bioclimatology are included.

I-12009
U.S. Environmental Data Service
CATALOGUE OF METEOROLOGICAL SATELLITE DATA -- TIROS IV, VI AND VIII TELEVISION CLOUD PHOTOGRAPHY. U.S. Weather Bureau. Key to meteorological records documentation, 1963, 1964, 1965 5.34, 5.36, 5.38, 3 Volumes, Refs.
Z6685.U64

Complete listings of cloud photograph sequences obtained by the TIROS IV, VI, and VIII meteorological satellites are presented with a set of maps showing the schematic nephanalysis for each sequence. Cloud picture transmissions received at Command-and-Data-Acquisition (CDA) stations were displayed on a television screen and simultaneously recorded on magnetic tape. Tabulated listings provide reel number; a legend for each picture including camera number, mode (tape or direct), orbit pass number, and station initial; and picture sequence data including orbital pass number, mode, camera number, date, time, frame, and geographical area covered. Copies of the photographs may be obtained from the National Weather Records Center, Asheville, N.C.

I-12010
U.S. Environmental Data Service
CATALOGUE OF METEOROLOGICAL SATELLITE DATA -- ESSA 1, 3, 5, 7, AND 9 TELEVISION CLOUD PHOTOGRAPHY. U.S. Weather Bureau. Key to meteorological records documentation, 1966, 1969, 1970, 1971 5.311, (5.316, 5.317), (5.318-5.321), (5.323-5.325), 5 Volumes
Z6685.U64

Complete listings of cloud photograph sequences obtained by the ESSA 1, 3, 5, 7, and 9 meteorological satellites are presented with a set of maps showing the schematic nephanalysis for each sequence. Cloud picture transmissions received at Command-and-Data-Acquisition (CDA) stations were displayed on a television screen and simultaneously recorded on magnetic tape. Tabulated listings provide reel number; a legend for each picture including camera number, mode (tape or direct), orbit pass number, and station initial; and picture sequence data including orbital pass number, mode, camera number, date, time, frame, and geographical area covered. Copies of the photographs may be obtained from the National Weather Records Center, Asheville, N.C.

I-12015
Koptev, A.P.
AEROMETEOROLOGICAL INVESTIGATIONS BY THE FOURTEENTH SOVIET ANTARCTIC EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.126-128, Translated from its Informatsionnyi biulleten', No.81, 1970.

The aerological program of the Fourteenth Soviet Antarctic Expedition emphasized study of atmospheric circulation, upper-air information, weather forecasting, and several new programs: field tests of the unified UAT GMS-4 automatic hydrometeorological station, development of a method of punching upper-air data on teletype tape, rocket sounding, upper-air and actinometric radio sounding by RKZ and ARZ radiosondes, recording of air temperature and humidity by EMP electronic bridges, and preparation of auxiliary synoptic charts and their transmission by facsimile equipment. UAT GMS-4 temperature readings were found to be more accurate than mercury thermometers during the day and equally accurate at night. Albedo of snow and ice according to weather conditions and crystalline structure, sudden warming of the stratosphere, ground air temperature variations, and the thermal properties of land ice (to a depth of 230 m by core sampling) are discussed briefly.

I-12017
Beliazo, V.A.
SHORT-PERIOD TEMPERATURE FLUCTUATIONS IN THE MIRNYY AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.131-133, Translated from its Informatsionnyi biulleten', No.81, 1970. 6 refs.

The characteristics of monthly variations in air temperature anomalies at Mirnyy Station for the 1956-1968 period are investigated. Graphs show air temperature anomalies and the breakup of fast ice on Mirnyy Roads as a function of those anomalies. Positive temperature anomalies in February and November are followed the next year by an early breakup at the Roads (end of December-beginning of February). The relationship between the anomalies and stratospheric anticyclones is mentioned.

I-12018
Sakunov, G.G.
SOME RESULTS OF COMPUTATIONS OF NATURAL ILLUMINATION IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.133-137, Translated from its Informatsionnyi biulleten', No.81, 1970. 2 refs.

Mean monthly intensity of global and diffuse radiation is computed from data in TM-12 tables for various cloud conditions at solar elevations of more than 5 degrees. Relations between global radiation and global illumination and between diffuse radiation and diffuse illumination are graphed and both global and diffuse illumination are computed for different solar elevations at four Soviet bases. It is found that at the same solar elevation global illumination increases with latitude, while diffuse illumination

increases only to that latitude at which elevation above sea level does not exceed the base of middle clouds and then it begins to decrease.

I-12019
Artem'ev, A.N. , Agafonov, V.V., Dranitsyn, G.N.
DAILY VARIATIONS IN THE STRATIFICATION OF THE ATMOSPHERIC BOUNDARY LAYER IN CENTRAL ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.138-141. Translated from its Informatsionnyi biulleten', No.81, 1970. 6 refs.

Air temperature profiles in the atmospheric boundary layer at Vostok Station are graphed. Vertical temperature gradients at Vostok according to time of day and year during 1969 are tabulated. Diurnal variations in the thermodynamic state of the atmosphere at Vostok are shown. The information was collected by radiosondes. It is concluded that the surface inversion weakens or is partly destroyed in the afternoon during spring and autumn at Vostok due to radiation factors. It is completely destroyed during the second part of the day in mid-summer. At that time, positive temperature gradients are observed throughout the boundary layer.

I-12020
Vasil'ev, A.A.
CLOUD DISTRIBUTION OVER THE ANTARCTIC IN SEPTEMBER-DECEMBER 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.141-143, Translated from its Informatsionnyi biulleten', No.81, 1970. 2 refs.

Cloud distribution is charted for all of Antarctica for Sept. 1-3, Oct. 1-15, Nov. 1-15 and Nov. 16-30 according to Nimbus-3 satellite photographs. The average cloud cover distribution was zonal, gradually increasing from low to middle latitudes, reaching a maximum at 50-60 degrees and then decreasing again. Cloudiness increased sharply in December. Maximum cloudiness was observed along known branches of cyclone trajectories.

I-12021
Tsigel'nitskii, I.I.
ANOMALOUS WARMING IN THE STRATOSPHERE IN AUGUST 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.144-146, Translated from its Informatsionnyi biulleten', No.81, 1970. 4 refs.

A sharp, brief warming in the lower stratosphere over Mirnyy was recorded during temperature-wind soundings during August 1969. Air temperature increased by 15 C at the 10-mb level within one day; the amplitude of temperature fluctuations increased with height; wind speed and temperature climaxed at the same time; humidity rose sharply; neutron intensity and magnetic activity index Kp increased during the warming period. Data supports earlier conclusions that stratospheric warming usually occurs at the end of winter and is accompanied by an increase in cyclonic activity at the surface and a considerable increase in wind velocity in the lower stratosphere. Charts show a vertical section of the atmosphere and synoptic conditions at 500 and 100 mb.

I-12022
Tsigel'nitskii, I.I.
DESCRIPTION OF THE TROPOPAUSE OVER MIRNY IN 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.147-150. Translated from its Informatsionnyi biulleten', No.81, 1970. 5 refs.

On the basis of temperature-wind soundings in 1969, the following tropopause parameters are examined: height, temperature, thickness, and frequency of types as compared to 1965. Surface synoptic charts and graphs of annual variations in height and temperature are included. Thickness decreased toward mid-winter (between 1.5 km and 0.3 km). During the snowstorms with cyclones passing, fluctuations were strongest. Multiple tropopause occurred mainly in winter. In years of high solar activity, the height and temperature of the tropopause fluctuate more than in years of low solar activity. The inversion type tropopause continued throughout 1969.

I-12038
Gerbovich, V.I.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.180-182. Translated from its Informatsionnyi biulleten', No.81, 1970.

Atmospheric pressure, air temperature, wind velocity, humidity, cloudiness, and average height of radiosonde ascent are tabulated for Nov.-Dec. 1970 at five Soviet stations. Cyclones and circulation patterns during the period are the main concern of the text. Some details are also given on geophysical investigations from Mirnyy Observatory and observations of birds and fast ice conditions.

I-12039
Tarand, A.Kh.
ICE FOG AT MOLODEZHNAYA STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.183, Translated from its Informatsionnyi biulleten', No.81, 1970.

The first winter fog ever seen at Molodezhnaya Station was recorded in September 1969 after a night of clear weather with drainage wind and rime formation. Air temperature dropped to -29C and humidity ranged from 70 to 80 percent. An advancing fog bank was seen far out at sea around noon. Ice needles fell at 3:00 pm. Fog was thick on land during late afternoons. By the next day evidence of a warm cyclone reaching a region with a strongly cooled surface was seen.

I-12056
Solot, S.B. , Angell, J.K.
MEAN UPPER-AIR FLOW IN SOUTHERN HEMISPHERE TEMPERATE LATITUDES DETERMINED FROM SEVERAL YEARS OF GHOST BALLOON FLIGHTS AT 200 AND 100 MB. Journal of the atmospheric sciences, Jan. 1973 30(1), p.3-12, 23 refs.

Five years of constant level balloon (GHOST) flights at 200 mb and three years of flights at 100 mb in Southern Hemisphere temperate latitudes (25-65 S) furnish information on the mean variation with time of year and longitude of zonal and meridional winds. There is evidence of a large annual variation in mean meridional wind at these surfaces, with the GHOST balloons moving toward the South Pole at a mean speed exceeding 20 cm/sec in the Southern Hemisphere winter and toward the equator at a similar speed in summer. The poleward flow in winter is associated with relatively strong west winds. The semiannual variations in meridional winds are indicated to be out of phase at 200 and 100 mb, with the

maximum poleward flow occurring near the equinoxes at 200 mb and near the solstices at 100 mb, implying the existence of meridional circulation cells with flows of opposite sense in the upper troposphere and lower stratosphere. The west wind is strongest over the Indian Ocean and the weakest near Cape Horn, and west and south winds are almost out of phase, i.e., standing wave number 1 efficiently transports momentum toward the South Pole. The poleward eddy flux momentum is a maximum in winter and occurs with greatest vigor over the South Atlantic.

I-12058
Uchikawa, K.
ON THE SEASONAL VARIATIONS OF THE ATMOSPHERIC ELECTRIC ELEMENTS. Pure and applied geophysics, Aug. 1972 Vol.100, p.54-59, 5 refs.

The air-earth current density in the stratosphere, the columnar resistance derived from the measurements of conductivity, and the ionospheric potential were investigated. The data were obtained by radiosonde ascents during the period of 1957-1967. It was found that the local horizontal visibility at the surface is related to the air-earth current density in the stratosphere, and it is expected that the air-earth current density has a seasonal variation. Statistical results show that indeed the air-earth current has a pronounced seasonal variation, high in winter and low in summer. The columnar resistance has also a seasonal variation, reverse to the variation of air-earth current. The percentage time variation of the air-earth current was found to be twice as much as the percentage time variation of the columnar resistance at Tateno Observatory. The ionospheric potential, deduced from the measurements of the potential gradient by radiosonde ascents, shows no clear seasonal variation at Showa-Base (Antarctica). Following Ohm's law, however, the above-mentioned results suggest that the seasonal variation of the ionospheric potential would exist on land. (Auth.)

I-12071
Rusin, N.P. , Rubinshtein, E.S.
INVESTIGATIONS OF THE METEOROLOGICAL REGIME OF THE ARCTIC AND ANTARCTICA. Leningrad. Glavnaia geofizicheskaia observatoriia, Voeikov Main Geophysical Observatory 1917-1967, Edited by M.I. Budyko, Jerusalem, Israel Program for Scientific Translations, 1970, p.352-360, Translated from Leningrad. Glavnaia geofizicheskaia observatoriia, Trudy, No.218, 1967. 34 refs.

Major Soviet works on the meteorological regimes of the Arctic and Antarctic are reviewed in chronological order covering the period since 1880. Scientists, expeditions, institutions, and their leading contributions to polar meteorology are covered.

I-12180
Kikuchi, K.
OBSERVATION OF CLOUD CONDENSATION NUCLEI AT SYOWA STATION, ANTARCTICA. Meteorological Society of Japan. Journal, Oct. 1971 49(5), p.376-383, In English with Japanese summary. 17 refs.

Observations of cloud condensation nuclei were carried out at Showa Station from the beginning of Feb. to the end of Dec. 1968 using a chemical diffusion chamber. The mean number concentrations of 0 and 1 percent supersaturations at the station were 300 and 800 particles per cu cm, respectively. The maximum concentrations of 0 and 1 percent were 3000 and 4000 and in only one case 9000 particles per cu cm at 1 percent was seen. The minimum concentrations of both supersaturations were nil, but in general they were approx 200 particles at 1 percent supersaturation. The high concentrations were observed in the range of the wind direction from ESE to S and they were related to the wind direction rather than wind velocity. The spectra of the number concentration in the range from 0 to 1 percent supersaturations showed two distinct patterns. These are described. An examination of the washout effect of cloud condensation nuclei before, during, and after solid precipitation was also carried out.

I-12209
Duce, R.A.
TRACE SUBSTANCES IN THE ANTARCTIC ATMOSPHERE. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.27-42, 26 refs.

Two major problems associated with local air pollution in Antarctica are 1) the possible upset of the delicate balance of natural biological activity in the vicinity of the pollution source and 2) contamination of large areas around the pollution source causing serious interference with global air pollution monitoring programs. The primary source of the pollution is the burning of fossil fuels for aircraft turbine engines, heating and power generation, surface vehicles, and aircraft. Analysis of I, Br, and Cl concentrations in air samples collected at McMurdo Station showed a strong positive correlation between both Br and Cl and wind direction. Major sources of trace metals in antarctic air are the sea, continental weathering, and air pollution. A technique for differentiating between these sources is described. Calculations to determine the contaminating effects of locally produced sulfur dioxide, nitrogen dioxide, and lead on monitoring programs for background levels of these substances in Antarctic air indicate that local production of Pb is potentially a much more serious contaminant of background atmospheric levels than NO2 or SO2. The potential danger of research stations contaminating large areas of the Antarctic environment and the need for pollution control measures are emphasized.

I-12214
Hedgpeth, J.W.
RADIOACTIVE CONTAMINATION IN THE ANTARCTIC. Colloquium on Conservation Problems in Antarctica, Sept. 10-12, 1971, Blacksburg, Va., Proceedings. Edited by B.C. Parker, Lawrence, Kansas, Allen Press, 1972, p.97-112, 26 refs.

The problems of radioactive contamination in the Antarctic are discussed, including the possible sources of contamination and the possible effects on ecological systems, particularly marine life. The foundation species of Antarctic waters may well be Euphausia superba. It is also possible that this species, which may concentrate zinc in its metabolic processes, could be a major agent in the transferring of radionuclides into the ecological system. There is as yet little understanding of the possible effects of concentrations of artificial radionuclides on organisms in very low concentrations or of the addition of low level radioactive wastes to the sea by effluents from installations or from fallout. Radioisotope pollution is, however, easily detected and its quantity readily measured. Two examples of

deliberate contamination of the environment in order to monitor the release of low level radioisotope wastes into the sea are the Windscale Works on the Irish Sea and the Columbia River Plume at Handford. Contaminating sources in the Antarctic include fallout from weapons tests, the nuclear power reactor at McMurdo, and the use of radioisotopes for scientific studies. While the potential source of contamination from the nuclear power reactor will be solved by removal of the reactor, small amounts of radioactive contamination from scientific activities will continue and possibly will increase.

See also:
A-10125,A-10556,A-10803,A-11015,
A-11016,A-11054,A-11055,A-11080,A-11081,
A-11100,A-11101,A-11159,A-11160,A-11175,
A-11648,A-11739,A-11907,A-11961,A-12023,
B-10285,B-10940,B-11111,B-11112,B-11210,
B-11320,B-11391,B-11694,B-11765,B-11768,
B-12101,B-12123,B-12228,B-12229,C-11036,
C-11517,C-11734,D-11218,E-10206,E-10268,
E-10302,E-10303,E-10304,E-10305,E-10306,
E-10484,E-10520,E-10555,E-10887,E-11191,
E-11296,E-11499,E-11523,E-11620,E-11969,
E-12201,F-10168,F-10249,F-10375,F-10412,
F-10439,F-10462,F-10589,F-10590,F-10682,
F-10828,F-10833,F-10843,F-10981,F-10989,
F-11156,F-11344,F-11457,F-11458,F-11459,
F-11584,F-11615,F-11644,F-11774,F-11855,
F-11947,F-11999,F-12029,G-10087,G-10097,
G-10166,G-10907,G-11033,G-12097,G-12098,
G-12202,H-11538,H-12076,H-12077,H-12078,
H-12087,J-10138,J-10289,J-10387,J-10389,
J-10392,J-10442,J-10767,J-10942,J-11234,
J-11288,J-11345,J-11413,J-11492,J-11707,
J-11709,J-11723,J-12025,J-12062,J-12182,
K-10745,K-10838,K-10864,K-11343,K-11432,
K-11433,K-11447,K-11448,K-11550,L-11918,
L-12129

J. OCEANOGRAPHY

J-10029
Watkins, N.D. , Kennett, J.P.
ANTARCTIC BOTTOM WATER: MAJOR CHANGE IN VELOCITY DURING THE LATE CENOZOIC BETWEEN AUSTRALIA AND ANTARCTICA.. Science, Aug.27, 1971 173(3999), p.813-818
Q1.S35

Paleomagnetic and micropaleontological studies of deep-sea sedimentary cores between Australia and Antarctica define an extensive area centered in the south Tasman Basin, where sediment as old as Early Pliocene has been systematically eroded by bottom currents. This major sedimentary disconformity has been produced by a substantial increase in velocity of Antarctic bottom water, possibly associated with late Cenozoic climatic cooling and corresponding increased glaciation of Antarctica.

J-10106
Biscaye, P.E.
MINERALOGY AND SEDIMENTATION OF RECENT DEEP-SEA CLAY IN THE ATLANTIC OCEAN AND ADJACENT SEAS AND OCEANS. Geological Society of America. Bulletin, July 1965 76(7), p.803-831, refs. p.829-831
QE1.G2

Semiquantitative mineral analysis was done by X-ray diffraction on the < 2 microns and 2-20 microns-size fractions of approx. 500 Recent deep-sea core samples from the Atlantic, Antarctic, western Indian Oceans and adjacent seas. Relative abundances of montmorillonite, illite, kaolinite, chlorite, gibbsite, quartz, amphibole, clinoptilolite-heulandite(?) and pyrophyllite(?) were determined. Geographic distribution, origin, sources and mineralogical characteristics of the sediments are discussed. The southern Argentine Continental Shelf, the Scotia Ridge and the Weddell Sea are likely immediate sources of fine-fraction sediments in the Argentine Basin. Transport from the Weddell Sea by the Antarctic bottom water may be responsible for the northward transport of fine-fraction sediment along the western South Atlantic up to the Equator. (Auth. mod.)

J-10107
Rateev, M.A. , Gorbunova, Z.N., Lisitsyn, A.P., Nosov, G.L.
DISTRIBUTION OF CLAY MINERALS IN THE OCEANS. Sedimentology, Oct. 1969 13(1/2), p.21-43, 40 refs.
QE471.S4

Quantitative X-ray determination of clay minerals in the sediments of the Indian and Pacific Oceans was carried out by applying the method which was used in studies of the Atlantic Ocean by P.E. Biscaye, (see J-10106). Two groups of minerals are distinguished according to their location. The first group consisting of kaolinite, gibbsite and montmorillonite is in tropical-humid zones. The second group containing chlorite and illite is located in moderate and high latitudes, chiefly with cold, moderately humid and ice zones forming a so-called "bipolar"-type distribution. Illites are the dominant element in morainic material of the Antarctic. (Auth. mod.)

J-10117
Mopper, K. , Garlick, G.D.
OXYGEN ISOTOPE FRACTIONATION BETWEEN BIOGENIC SILICA AND OCEAN WATER. Geochimica et cosmochimica acta, Nov. 1971 35(11), p.1185-1187, 1 ref.
QE351.G425

The suitability of siliceous radiolaria skeletons in deep sediments for oxygen isotope investigations was determined. Equatorial and Antarctic deep-sea cores were used in the analysis.

J-10121
Bienati, N.L. , Comes, R.A.
SEASONAL VARIATION OF THE PHYSICAL AND CHEMICAL COMPOSITION OF SEA WATER IN PARADISE HABOR, WEST ANTARCTICA. Variación estacional de la composición fisico-quimica del agua de mar en puerto Paraíso, Antártida Occidental. Buenos Aires. Instituto Antártico Argentino. Contribución, 1970 No. 130, 45p., In Spanish with English, French, German and Italian summaries. 5 refs.

Sea water samples collected in Paradise Harbor (Almirante Brown Station) up to 90 m of depth in 1965, 1967 and 1968 were analyzed for salinity, dissolved oxygen, pH, total alkalinity and nutrients (phosphates and nitrites). Temperature measurements were carried out on surface (three daily observations) and at 5, 10, 15, 20, 50 and 90 m of depth. Comparative diagrams and readings made with the data obtained, show the individual and sometimes associated variation of the elements. This paper is a report on observational data, without entering into the speculative phase of explaining the phenomena, which is reserved for another paper. (Auth. mod.)

J-10133
Neshyba, S. , Neal, V.T., Denner, W.
TEMPERATURE AND CONDUCTIVITY MEASUREMENTS UNDER ICE ISLAND T-3. Journal of geophysical research, Nov. 20, 1971 76(33), p.8107-8120, 23 refs.
QC811.J6

Marked step-like structure exists in vertical profiles of temperature and salinity obtained in the Arctic Ocean. This structure occurs between 200 and 500 m depth, where both temperature and salinity increase with depth. Comparison is made with the fine structure in the waters of Lake Vanda on the Antarctic Continent, where both temperature and salinity also increase with depth. Observed temperature gradients in the upper portion of Lake Vanda are linked to the penetration of solar heating. The deeper water of this lake shows a strong density stratification but layering is not reported within this deeper zone. In contrast, the Arctic Ocean water, in the 200-500 m depth interval where well defined layering is found, has relatively weak density stratification and negligible solar heating. The layering in the Arctic water is attributed to a double-diffusive process.

J-10134
Baker, F.W.G.
NATIONAL CONTRIBUTIONS TO THE OCEANOGRAPHY PROGRAM. Annals of the International Geophysical Year, 1969 46, p.6-22
QC801.3.S6
The countries participating in the IGY Oceanographic Program are listed and their contributions to the program briefly described. In the Antarctic 9 ships participated in the collection of data between 1956 and 1959. Over 8,000 bathythermographs were obtained as well as over 80 sediment cores, 58 bottom samples, and 13 bottom photographs. Extensive biological collections were made, precision bathymetry and the collection of large water samples were carried out, and standard hydrographic stations were established.

J-10135
Kort, V.G.
OCEANOGRAPHIC INVESTIGATIONS IN THE ANTARCTIC. Annals of the International Geophysical Year, 1969 46, p.113-127
QC801.3.S6
The 1957-58 IGY program included extensive and varied oceanographic research in the Antarctic although the majority of the investigations were made by the research ships on their way to and from the Antarctic as a secondary part of their programs. The investigations carried out by three Soviet Marine Antarctic Expeditions in 1956-58 on the diesel-electric ship Ob' and some work carried out by the USA and Argentine vessels are exceptions. The Antarctic expeditions during which oceanographic observations were made, quantitative results of the observations, and routes of the expeditions are listed. The basic scientific results of the Soviet oceanographic investigations in the Antarctic are summarized under the following headings: aerometeorology, physical and chemical oceanography, marine geology, hydrobiology, geophysics, cartography and hydrography.

J-10136
Udintsev, G.B.
IGY INVESTIGATION OF SUBMARINE TOPOGRAPHY. Annals of the International Geophysical Year, 1969 46, p.131-147, 73 refs.
QC801.3.S6
Data collected on submarine topography during the IGY are reviewed and conclusions drawn from the various investigations are summarized. Important features of the IGY investigations were the broad application of the most up-to-date methods and coverage of the entire world ocean. The southern part of the Pacific Ocean was covered by the American Deep-Freeze 1, 2, and 3 expeditions on the Atka, Glacier, Edisto, Arneb, Northwind, Staten Island, Burton Island and Westwind. Very detailed investigations were conducted in the region between New Zealand and Antarctica and in the Ross Sea. The Argentinian expeditions on the Capitan Canepa and General San Martin studied submarine topography in the region of Drake Passage. In the southern part of the Indian Ocean, the floor relief was studied by the Ob' during its 1st, 2nd, 3rd, and 4th cruises and the Lena.

J-10137
Bezrukov, P.L. , Lisitsyn, A.P.
BOTTOM SEDIMENTS. Annals of the International Geophysical Year, 1969 46, p.148-184, Refs. p.176-184.
QC801.3.S6
During the IGY valuable data on Antarctic bottom sediments were obtained by the Ob' during cruises in the South Pacific and Indian Oceans and by the American Deep Freeze 1, 2, 3, and 4 expeditions in the South Pacific. Smaller expeditions from Australia, New Zealand, Japan, and Argentina also collected bottom sediments from Antarctic waters. Important results of the following IGY investigations are discussed: the role of sea ice and icebergs in transporting sediment material, turbidity currents, stratigraphy of bottom sediments, and the distribution, quantity, and granulometric and material composition of suspended solid matter. New methods of determining absolute ages and paleotemperatures, and of studying biostratigraphy and the cosmogenic component in ocean sediments are also discussed.

J-10138
Miyake, Y.
ARTIFICIAL RADIOACTIVITY. Annals of the International Geophysical Year, 1969 46, p.187-190, 22 refs.
QC801.3.S6
Data from the sampling of ocean water for artificial radioactivity in both the Northern and Southern hemispheres are reviewed. Extensive studies of the C-14 content of sea water in the Atlantic during the IGY indicated that in surface waters, C-14 values decreased with latitude from the north to the south between 80N and 60S, showing a sharp drop at the Antarctic convergence. The South Pacific average was close to that for the South Atlantic. In deep waters, the water originating at the Antarctic surface always showed lower values of C-14 than that originating in the northern part of the North Atlantic. In both the North and South Atlantic central waters, the C-14 values decreased with decreasing temperature.

J-10189
Lin'kova, T.I. , Lisitsyn, A.P.
PALEOMAGNETIC INVESTIGATIONS OF BOTTOM SEDIMENTS IN THE ANTRACTIC SECTION OF THE INDIAN OCEAN. Paleomagnitnye issledovaniia donnykh otlozhenii Indiiskogo sektora Antarktiki. Akademiia nauk SSSR. Doklady, Aug. 21, 1971 199(6), p.1409-1414, In Russian. 7 refs.
AS262.S3663
Paleomagnetic data from 12 cores of sea-bottom sediments obtained by the Ob' in the southern part of the Indian Ocean in 1955-57 are given. The series of measurements made on astatic magnetometers provide a magnetic stratigraphy with a record of the paleomagnetic zones. The thickness of the upper zone showing positive polarity varies considerably from 420 cm off the Antarctic coast to 20 cm at 37 deg 13 min S, 67 deg 28 min E, perhaps due to different rates of sedimentary accumulation. Sedimentation rates are calculated for the last 700,000 yr, the last epoch of positive polarity.

J-10190
Shcherbinin, A.D.
RELATIONSHIP BETWEEN CIRCULATION AND WATER STRUCTURE OF THE INDIAN OCEAN. O vzaimosviazi tsirkuliatsii i struktury vod Indiiskogo okeana. Akademiia nauk SSSR. Doklady, Aug. 21, 1971 199(6), p.1413-1416, In Russian. 5 refs.
AS262.S3663

An analysis of the hydrodynamic and hydrochemical (temperature, salinity, density, and dissolved oxygen) properties in a vertical plane of the Indian Ocean, including Antarctic waters of the ocean, shows natural boundary lines of structural zones and boundary layers between the zones. Four structural zones, surface, intermediate, deep, bottom, are described. Each structural zone is characterized by a certain water circulation system and water properties. Boundary layers, at mean depths of 400, 1600, and 4000 m, in which water circulation transitions occur, are the contact media for the exchange and transformation of waters in adjacent structural zones. Data on the boundary layers are useful in hydrodynamic calculations.

J-10209
Gill, A.E. , Bryan, K.
EFFECTS OF GEOMETRY ON THE CIRCULATION OF A THREE-DIMENSIONAL SOUTHERN HEMISPHERE OCEAN MODEL. Deep-sea research, July 1971 18(7), p.685-721, 28 refs.
GC1.D25

A series of numerical experiments on the circulation of the Antarctic region have been carried out in order to study the effect of baroclinicity and geometry on the circumpolar current and the Antarctic Convergence. Comparisons are made between model oceans which do and do not have barrier free zones ('Drake Passage'). Limitations of computer storage require the parameters used to be somewhat different than those applicable to the ocean. However, certain conclusions can be drawn. The existence of the barrier free zone is offered as an explanation of the formation of Antarctic Intermediate Water in latitudes a little north of the latitude of Cape Horn. It is found that when the model 'Drake Passage' is as deep as the rest of the model ocean (which is of uniform depth), the circumpolar current is predominantly wind-driven. When the model 'Drake Passage' is only half as deep, the transport of the current is increased nearly three times and the predominant driving mechanism appears to be 'thermal'. (Auth.)

J-10289
Fairhall, A.W. , Bradford, P., Yang, I.C., Young, A.W.
CARBON-14 IN THE SOUTHERN OCEANS FROM NUCLEAR BOMBS. Antarctic journal of the United States. Sept.-Oct. 1971 6(5), p.163-164, 3 refs.

Data from water sampling in the southern oceans for natural and bomb-produced radiocarbon are summarized. The C14 specific activity, corrected for isotope fractionation, is plotted as a function of depth at a number of locations and compared with earlier data of Bien et al (1965; J-3744) and Rafter (1968; J-6764). The Antarctic Circumpolar Water is characterized by C14 levels of around -150 per mill more or less independent of geographic location. Significantly lower levels were observed by Rafter in the region of the Ross Sea. At mid-latitudes significant enrichment by bomb C14 is noted in the upper layers, -50 per mill being a resonable upper limit for natural C14 levels of the surface layer at these latitudes.

J-10290
Grinnell, D.V.
PHYSIOGRAPHY OF THE CONTINENTAL MARGIN OF ANTARCTICA FROM 125E TO 150E. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.164-165, 4 refs.

A physiographic province-topographic feature diagram is presented, based on a bathymetric map (in preparation) of the continental margin of Antarctica from 125 E to 150 E on a scale of 1:1,000,000 and with an isobath interval of 100 fathoms. The physiographic provinces shown are bounded by significant changes in slope at 2,000 to 2,300 fathoms, at 1,600 to 2,000 fathoms, at 500 to 1,300 fathoms and at 100 to 400 fathoms. Individual topographic features are shown either symbolically or with a single isobath along a feature's boundary. In this part of Antarctica, the average width of the continental shelf is about 130-150 km and the average depth, approx 200 to 300 fathoms. The unusually great depths can be attributed to erosion of the bedrock during periods of greater seaward extension of present and past coastal outlet glaciers. Among the features of the continental shelf are submerged glacial troughs, "drowned fjords," and large discontinuous troughs and basins. The shelf ends abruptly seaward.

J-10291
Gordon, A.L.
ELTANIN PHYSICAL OCEANOGRAPHY, CRUISES 44, 45, AND 47. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.166-167, 6 refs.

Hydrographic data obtained on Eltanin Cruises 44, 45, and 47, June 1970-Apr. 1971, are presented. Cruise 44 was designed to study the interaction of the Macquarie Ridge and the Antarctic Circumpolar Current. A rather large southward deflection of the bulk of the current and its abrupt return northward after outflanking the ridge is indicated by the density field. During Cruise 45, which was basically a geological study, two hydrographic profiles were obtained south of Western Australia. The crossings of the Antarctic Convergence showed it to be about 200 km north of the Mackintosh position. Eltanin Cruise 47 was the first of a series of expeditions deep into the Indian Ocean sector of Antarctic waters. The Cruise 47 hydrographic data were taken mainly over the Kerguelen Plateau and about its flanks. The deep water east of the Plateau is colder than that to the west, suggesting a possible counterclockwise deep circulation about the plateau. During the cruise a chemical program was carried out in close correlation with the hydrographic program.

J-10292
Houtz, R.E.
LAMONT-DOHERTY GEOPHYSICAL PROGRAM ON ELTANIN CRUISES 44, 45, 47, AND 47A. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.167

The Lamont-Doherty geophysics group aboard Eltanin achieved 98 percent coverage of the total ship's track with underway geophysical data. The data include seismic, magnetic, and gravity measurements. In addition to recording geophysical data, the geophysics group also has responsibility for digitizing topographic data, computing the ship's adjusted track, and reconciling this information with the primary geophysical data. These tasks are performed with a shipboard IBM 1130 computing system. On Cruise 44, a hydrographic cruise, the Macquarie Ridge and Solander Trough south of New Zealand were studied in detail and fundamental geophysical data relating to seafloor spreading and plate tectonics were obtained. Submarine geology and piston-coring were emphasized during Cruise 45. A comprehensive geophysical survey of the Kerguelen Plateau south to the Antarctic Circle, carried out during Cruise 47, revealed complex tensional faulting and very thick sediments (1 to 2 km near the crest of the plateau). A prominent sediment ridge and numerous slump features exist

along the eastern edge of the plateau.

J-10293
Watkins, N.D.
STUDIES OF ELTANIN DREDGED ROCKS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.167-168, 5 refs.

Examination of the paleomagnetic, petrological, and geochemical properties of Eltanin dredged rocks from the collection up through Cruise 27 has been completed. The effect of rapid quenching on the magnetic and opaque mineralogical properties of submarine basalts has been demonstrated. Investigation of the Scotia Sea materials indicates that they were derived mainly from the Weddell Sea and the east coast of the Antarctic Peninsula. Materials from the Subantarctic regions of the South Pacific have also been studied.

J-10294
Capurro, L.R.A.
WEDDELL SEA OCEANOGRAPHIC RESEARCH 1971. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.168

During Jan. and Feb. 1971, 22 oceanographic stations were occupied in the Weddell Sea aboard the icebreaker General San Martin as a continuation of the systematic survey initiated during the International Weddell Sea Oceanographic Expedition. Physical and chemical measurements were carried out at each of the stations. The data have already been processed and are being analyzed together with information collected during the previous years. Current measurements were made while the ship was docked to the fast ice of the Filchner Ice Shelf, at General Belgrano Base.

J-10295
Anderson, J.B.
MARINE ORIGIN OF SANDS IN THE WEDDELL SEA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.168-169, 4 refs.

In 1969, as part of the International Weddell Sea Oceanographic Expedition, sea-bottom cores were obtained near Berkner I. that contained thick units of sands. Size analysis and electron microscope studies led to the conclusion that nearby sands represent ancient dune and beach deposits. Examination of 5 cores taken at 252 m depth near the ice shelf revealed sand bodies ranging in thickness from 15 to 75 cm. Sands are moderately to well sorted, fine- to medium-grained, and exhibit both Eolian and glacial surface textures. Graded bedding, the presence of a small, mixed shallow and deep water fauna, and diminution in grain size away from the ice shelf indicate that these sands have been deposited by bottom currents. Piston coring during the IWSOE-70 expedition resulted in the discovery of other well sorted sand bodies along the east coast of the Weddell Sea. The suggested derivation, possibly by reworking, is from glacial marine materials in relatively shallow water.

J-10296
Payne, R.E. , Conolly, J.R., Abbott, W.H.
VARIATION AMONG ELTANIN PISTON CORES: AN INTENSIVE CORING STATION IN THE WILKES ABYSSAL PLAIN. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.169-170, 5 refs.

One of the greatest problems facing geologists who work with piston cores from the ocean floor are the uncertainties that samples obtained are representative of the cored sediment. To test this problem and to gain further insight into the feasibility of correlating one turbidite bed to another, five piston cores were taken from one station on Eltanin Cruise 44 in one of the deepest and flattest regions of the Wilkes Abyssal Plain. The five cores taken are all long (10 to 23 m) and are characterized by interbedded siliceous ooze zones and terrigenous turbidite mud beds. These terrigenous muds, often with basal sands and silts, contain quartz, feldspars, amphiboles, and rock fragments along with quartz-rich illites derived from the Antarctic Continent. Detailed examination of each core using smear slides at 10-cm irervals down the core and examination of the diatom assemblages show that several major zones in the cores can be correlated and that the piston coring technique is commonly not perfect.

J-10297
Osmond, J.K. , Scott, M.R., Anderson, J.B.
DEEP-SEA SEDIMENT ACCUMULATION RATES NEAR ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.170-171

Sedimentation rate determinations have been made on Eltanin deep-sea cores from the Indian-Antarctic basin and on International Weddell Sea Oceanographic Expedition cores from the Weddell Sea by thorium-230 excess decay curves, which are useful for periods up to 300,000 yr. Two complementary analytical techniques are employed: (1) chemicalisotope analysis, involving tracer techniques and alpha pulse height analysis, and (2) nondestructive gamma ray analysis. The alpha counting method is more precise and laborious, but the gamma counting method, if properly calibrated, can yield useful sedimentation rate data with very little effort. On both sides of Antarctica sediments are accumulating at a very low rate, generally less than a centimeter per 1,000 yr. In portions of the Indian-Antarctic basin, foraminiferal ooze deposits are accumulating at rates of 3 to 5 cm per 1,000 yr. Low sedimentation rates determined for cores from the abyssal floor of the Weddell Sea indicate that ice rafting has been an insignificant depositional agent in this area for at least the past 300,000 yr.

J-10298
Abbott, W.H.
DIATOM INVESTIGATIONS OF SOUTHERN OCEAN DEEP-SEA CORES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.171-172, 5 refs.

In the present investigation an attempt is made to tie together previous work by Zhuze (1963; E-766) and Donahue (1967; E-6803 and 1970; Unpublished thesis) on the stratigraphic range of diatom species and to define a stratigraphic zonation in conjunction with paleomagnetic stratigraphy that could be used to correlate siliceous oozes throughout the southern oceans. Investigations of cores taken in the Wilkes Abyssal Plain have shown very good correlation with three of Donahue's (1970) zones: the Fragilariopsis kerguelensis partial range zone (0.35 m. y. BP to the Recent), the Rouxia californica partial range zone, Upper Pleistocene in age (0.66 to 0.35 m. y. BP); and the Actinocyclus ingens concurrent range zone, Lower to Middle Pleistocene in age (0.66 to about 1.67 m. y. BP). Glacial and interglacial periods are being investigated through the use of polar and subpolar assemblages. Tertiary diatoms will also be considered.

J-10299
Bandy, O.L. , Theyer, F.
GROWTH VARIATION IN GLOBOROTALIA PACHYDERMA (EHRENBERG). Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.172-174, 7 refs.

Current studies of Eltanin collections reveal interesting relationships in Globorotalia pachyderma (Ehrenberg) between growth of specimens, the development of kummerforms and calcification. This led to comparisons of populations from northern and southern oceans in both plankton and sediment samples. In Antarctic surface plankton tows, specimens are normalform wherein the last chamber shows the same continuous expansion trend of the earlier chambers. Arctic surface tows, however, show both normalforms and kummerforms. Conversely, specimens from sediment samples are dominantly kummerforms in which the last chamber shows a reduction in size from the growth pattern of the earlier chambers. Extremely calcified specimens appear to be restricted to Antarctic waters.

J-10300
Woodroffe, D.S.
ELTANIN CRUISE 47A. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.174

The primary objective of the underway geophysics program conducted on Cruise 47A, Apr. 20, 1971 to May 10, 1971, was to investigate the history of the Tasman Basin by gathering geophysical information on the Tasman abyssal plain and the western flank of the Lord Howe Rise. Six east-west traverses were made across the survey area. A preliminary study of the geophysical records obtained indicates that the northern section of the Tasman Basin may be divided into two main zones. Zone 1 consists of an abyssal plain adjacent to the Australian continental margin, with an eastern boundary parallel to the margin. Reverberant material predominates in the topmost layer of this zone's sediment column, transparent sediments being apparent on the eastern side. Zone 2 extends from zone 1 to the Lord Howe Rise. Acoustically transparent sediment layers predominate. Ponded turbidites were encountered at the base of the Lord Howe Rise. Occasional basement peaks were apparent throughout zone 2. An area characterized by rough topography and seamounts and having a strike of 330 to 340 deg transects zone 2 and the northern end of zone 1.

J-10301
Watkins, N.D. , Kennett, J.P.
PALEOMAGNETISM AND MICROPALEONTOLOGY OF ELTANIN DEEP-SEA SEDIMENTARY CORES.. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p.174-175, 4 refs.

Paleomagnetic and micropaleontological definitions of the ages of the Eltanin sedimentary cores collected up through Cruise 39 have now been completed. A delineation of the Pliocene to Pleistocene regional sedimentary history between Australia, New Zealand, and Antarctica is therefore now possible. The results show that Brunhes to Late Gauss sediments are largely missing in an extensive area centered in the southern part of the Tasman Basin and the northern flank of the Southeast Indian Rise. This is due to a high-velocity Antarctic Bottom Water current, which both scours and inhibits deposition of all but the coarsest (sand size and above) fraction throughout much of the region. When present in the scour area, young sediments appear at least in part to be transported coarser fractions. Several cores have a coarse, winnowed upper surface. Available sea bottom photographs and bottom velocity measurements support this interpretation of the depositional environment.

J-10348
Venzke, N.C.
TIDAL MEASUREMENTS AT MCMURDO SOUND. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 231-232, 1 ref.

Although tides in McMurdo Sound have been measured frequently over the 16 yr of ship operations there, tide tables for the area do not exist. This year, programs sponsored by the U.S. Naval Support Force, Antarctica (NSFA), and the New Zealand Oceanographic Institute, a division of that country's Department of Scientific and Industrial Research (DSIR), are supplementing the earlier data. In Jan. 1971, a DSIR tide gage was installed near the discharge of the McMurdo Station distillation plant, where it stays free of ice during the austral summer. Data from this gage were vital to a bottom survey of Winter Quarters Bay made by USCGS Staten Island in Jan. and may be sufficient for the preparation of preliminary tables for Deep Freeze 72. Variations in pressure--tidal variations--are transmitted to the recorder through the tube. In early Feb. the DSIR gage was removed, and the NSFA gage was installed in the intake to the distillation plant, an ice-free area. This gage is a portable, automatic one that is activated by a float as it rises and falls in a tube. Data from both gages are expected to be sufficient for development of comprehensive tide tables.

J-10365
Watkins, N.D.
USNS ELTANIN CRUISE 48 TO MID-INDIAN AND BROKEN RIDGES. Antarctic journal of the United States, Nov.-Dec. 1971 6(6), p.269-271

Eltanin Cruise 48 was designated as a multi-disciplinary cruise with emphasis on marine geology and geophysics. The main objective of the cruise was to investigate the Broken Ridge and the N flank of the Mid-Indian Ridge in the vicinity of Amsterdam I. The marine geophysics program comprised magnetic, gravity, and seismic profiling and resulted in substantial data relevant to the genesis of the aseismic and main ridge systems. In the geology program over 50 piston cores were collected in the traverses and the rock dredging operations yielded a variety of grabs. The hydrology program comprised bottom camera, nephelometer, and bottom current meter observations, bathythermograph and Nansen casts, water sampling for C-14 analysis, and continuous sea surface temperature measurements, as well as associated on-board analyses.

J-10366
Schlich, R. , Patriat, P.
OCEANOGRAPHIC EXPEDITIONS OF THE GALLIENI IN THE SOUTH INDIAN OCEAN (1967-1970). Campagnes océanographiques du "Gallieni" dans l'océan Indien Austral (1967-1970. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan-June 1970 No. 50-51, p.3-23, In French.

The two branches of the mid-Indian Ocean ridge between Crozet, Kerguelen, Amsterdam and Maurice Islands were investigated during several trips of the Gallieni (1966-1969) by means of echo soundings, magnetometer measurements and seismic reflection soundings. Profiles of the eastern branch of the ridge south of Amsterdam I. showed magnetic anomalies identical to those found between Australia and Antarctica, and

farther east in the Pacific Ocean. Thus the structure south of Amsterdam I. can be tied to the well-known pacific structure, indicating an extension of this ridge over a distance of some 10,000 km. The western branch was found to have a very uneven topography, with no clearly discernible trough or fracture line.

J-10378
Duedall, I.W. , Coote, A.R.
OXYGEN DISTRIBUTION IN THE SOUTH ATLANTIC. Journal of geophysical research, Jan. 1971 77(3), p.496-498, 7 refs.

A new section for dissolved oxygen in the South Atlantic is presented. It has been prepared from data collected during the Hudson 70 expedition. The section, along the 30 deg W meridian from the equator to 55 deg S, confirms that the main oxygen features along this line have remained essentially constant over the last 40 years. The main oxygen distribution features of the section are North Atlantic Deep Water, Antarctic Bottom Water, and Antarctic Intermediate Water.

J-10387
WORLD OCEAN. Mirovoi okean. Voprosy geografii, 1970 No.84, 271p., In Russian. Refs.
G23.V6

The book is a collection of articles reviewing the following main topics: current research objectives in oceanography, methods of investigation, food and energy resources in the seas, atmospheric circulation over the ocean, structure and dynamics of sea water, sea ice and its relationship to climate and hydrology, and activities of oceanographic research institutions and projects in the Soviet Union. For abstracts of selected papers see J-10388 to J-10394.

J-10388
Dobrovol'skii, A.D.
WORLD OCEAN AND ITS INVESTIGATIONS BY SOVIET EXPEDITIONS. Mirovoi okean i ego issledovanie ekspeditsiiami Sovetskogo Soiuza. Voprosy geografii, 1970 No.84, p.4-15, In Russian. 14 refs.
G23.V6

General principles and results of the division and classification of the World Ocean from the geographical viewpoint are discussed. The boundaries of the Pacific, Atlantic, and Indian Oceans in the S are taken along the 47 W, 20 E, and 147 E meridians while the boundary of the Southern Ocean is still assumed to be along the Antarctic Convergence, which has a compound and variable profile. Various sea-borne expeditions, including that of the Ob', during which investigations were carried out in Antarctic waters since 1956, are described. Other activities of the USSR, including international cooperation, are considered.

J-10389
Sorkina, A.I.
PATTERNS OF ATMOSPHERIC CIRCULATION OVER THE OCEANS. Osobennosti atmosfernoi tsirkuliatsii nad okeanom. Voprosy geografii, 1970 No.84, p.66-79, In Russian. 12 refs.
G23.V6

The main features of atmospheric circulation over the World Ocean, including the Antarctic region, are given. Conditions, under which different types of air masses are found in the cyclonic and anticyclonic centers of the Northern and Southern Hemispheres, are discussed. Patterns of the principal types of oceanic climates determined by the seasonal displacements of predominant air flow are analyzed.

J-10390
Agenorov, V.K.
AREAL DISCRETENESS OF DEEP-SEA STATIONS. Prostranstvennaia diskretnost' glubokovodnykh gidrologicheskikh stantsii. Voprosy geografii, 1970 No.84, p.151-173, In Russian. 3 refs.
G23.V6

The calculation method used for determining the areal and linear discreteness of the deep-sea stations which study temperature and salinity of the World Ocean is discussed, and the mean and latitudinal values for each ocean, including the Southern Ocean, and for the World Ocean as a whole, are given. According to the data obtained up to Jan. 1, 1967, the greatest areal and linear discreteness is in the zones from 10-15S to 50-55S, and in waters between Australia and Antarctica.

J-10391
Sapozhnikov, V.V.
USE OF HYDROCHEMICAL DATA FOR DETERMINING SEA WATER DYNAMICS. Ispol'zovanie gidrokhimicheskikh kharakteristik dlia vyiavleniia dinamiki vod okeana. Voprosy geografii, 1970 No.84, p.213-223, In Russian. 21 refs.
G23.V6

Charts on the distribution of temperature, salinity, oxygen, oxygen deficit, and phosphates, from the surface to a depth of 1000 m in the Indian Ocean show a similarity in main details which reflect the macrostructure of the ocean. In deep waters below 1000 m from the Antarctic toward the Indian Ocean coasts the phosphate concentration and oxygen deficit gradually increase, while the oxygen concentration decreases. On the basis of the stoichiometric relation between oxygen and phosphorus in the biosynthesis and mineralization of organic matter, new quasiconservative characteristics were obtained for waters of the Indian Ocean. To determine the age and distribution of sub-Antarctic intermediate water, data on the concentrations and oxidation correlations between oxygen and phosphate were used.

J-10392
Nazarov, V.S.
ICE COVER OF THE OCEANS AND THE CLIMATIC PROCESSES OF THE EARTH. Ledianoi pokrov okeanov i napravlennost' klimaticheskikh protsessov Zemli. Voprosy geografii, 1970 No.84, p.224-232, In Russian. 7 refs.
G23.V6

The calculation of total volume and of seasonal and annual variations of sea ice in the Northern and Southern Hemisphere indicates that the trends of increase and decrease coincide in the two hemispheres. Sea ice cover serves mainly as an index of thermal conditions of the Earth, while polar glaciations regulate the changes in climatic zones of the Earth. Variations of sea ice cover are related to solar activity, wind, and air temperature, and may serve as a basis for predictions of the Earth's climate for the next 20-30 yrs.

J-10393
Chizhov, O.P. , Bazheva, V.IA.
ICE-CAPPED ISLANDS IN THE ARCTIC AND ANTARCTIC.

Ostrova - ledianye shapki v Arktike i Antarktike. Voprosy geografii, 1970 No.84, p.243-254, In Russian. 10 refs.
G23.V6

The mass balance of ice caps on islands and of ice-capped islands differs as follows: the former are nourished by snow and are spent by melting and evaporation; the latter, in addition to these factors, have ice discharge by calving. The ice-capped islands are models of large ice sheets in Greenland and the Antarctic. Data on mass balance of ice caps in the Arctic and Antarctic are given. Further investigations on ice-capped islands are suggested.

J-10394
Ioganson, V.E.
BRIEF REVIEW OF THE ACTIVITY OF THE OCEANOGRAPHIC COMMITTEE (1948-1968). Kratkii obzor deiatel'nosti Gidrologicheskoi komissii (1948-1968 gg. Voprosy geografii, 1970 No.84, p.255-257, In Russian.
G23.V6

Activities of the Oceanographic Committee of the Moscow Branch of the Geographic Society from 1948 to 1968 are briefly reviewed, dealing with the broad subject areas of hydrology, glaciology, and oceanology. The results of observations carried out on the World Ocean, including the Arctic and Antarctic regions, have been reported in more than 150 papers given at the committee's meetings. Numerous collective works and issues have been published by the committee during the 20-yr period of its existence.

J-10414
Fujiwara, K.
SOUNDINGS AND SUBMARINE TOPOGRAPHY OF THE GLACIATED CONTINENTAL SHELF IN LUTZOW-HOLM BAY, EAST ANTARCTICA. Antarctic record, July 1971 No.41, p.81-103, In Japanese with English summary. 21 refs.

Bathymetric charts of the 60 km-wide shelf extending into N.E. Lutzow-Holm Bay, were drawn, using numerous sounding data obtained by the icebreaker Fuji during 1965-1970 and by the author in 1968. Analyses of the charts indicated the following: 1) The shelf near Showa Station is generally 100-200 m deep, and deepens gradually to 350-400 m at the outer margin of the shelf. 2) In the inner part of the shelf, there is a highly glaciated sea floor with a coupled linear arrangement of rises and troughs due to the schistosity and joint structures of the bedrock. 3) The bottom of the broad glacial troughs is about 400 m deep near the coast and becomes shallower toward the offing, showing an undulating longitudinal profile. Such troughs are recognized only in the inner part of the shelf at least 20 km off the coast. 4) Close to the coast, there are narrow channels, deeper than the broad troughs, of two kinds: one reaches longitudinally from the front of the present glaciers and another runs parallel to the coast. The latter seems to be controlled by rock structures, such as schistosity, although there is no evidence of recent tectonic movements related to their origin.

J-10419
Hayes, D.E. , Edgar, N.T.
EXTENSIVE DRILLING PROGRAM PLANNED FOR GLOMAR CHALLENGER IN ANTARCTIC WATERS. Antarctic journal of the United States, Jan.-Feb. 1972 7(1), p.1-4, 2 refs.

The Glomar Challenger is essentially a 10,500-ton standard drilling ship modified to meet the requirements of the Deep Sea Drilling Project (DSDP). The vessel is equipped with a dynamic positioning system, has a length of 400 feet, beam of 65 feet, and loaded draft of 20 feet. Amidships is a 142-foot derrick and forward is an automatic drill pipe racker containing 7000 meters of 14-cm drill pipe. A program of drilling in high southern latitudes has been planned by the DSDP of the Scripps Institution of Oceanography in conjunction with the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES) Planning Committee, the JOIDES Antarctic Advisory Panel, the National Science Foundation's Offices of Polar Programs and National Centers and Facilities, and Global Marine, Inc. At least five 56-day cruises of Glomar Challenger spanning three austral summers are proposed.

J-10420
McWhinnie, M.A.
INTEGRATED BIOLOGICAL APPROACH TO MARINE ECOSYSTEMS. Antarctic journal of the United States, Jan.-Feb. 1972 7(1), p.5-12, 40 refs.

The rich productivity of the unique environment of the Antarctic waters and the biota supported therein are discussed. A broad perspective is given of the goal of studies of the Office of Polar Programs of the National Science Foundation to understand the south polar marine ecosystem. Studies were initiated in 1969 with Eltanin Cruise 38, continued on Cruise 46 (1970-71), and currently extended on Cruise 51 (1972). The various types of equipment used and some specimens taken during the cruises are described and illustrated.

J-10421
Griffiths, K.H., Jr.
USNS ELTANIN CRUISE 49 SOUTH AND WEST OF AUSTRALIA. Antarctic journal of the United States, Jan.-Feb. 1972 7(1), p.13-14

Cruise 49 of Eltanin began and ended at Fremantle, W. Australia. The 57-day cruise which lasted from August 31 to Oct 27, 1971, covered 7300 nautical miles and included 55 stations. Described are the underway programs and station operations for a systematic survey of the geophysical, hydrographic, and geological characteristics of an area S and W of Australia bounded by 90 and 110 E and 40 S and the N perimeter of the pack ice. Four complete N-S traverses were made along longitudes 90, 95, 100, and 110 E.

J-10440
Chikovskii, S.S.
SEA WATER SUPERCOOLING IN SITU AND IN LABORATORY. O pereokhlazhdenii morskikh vod v prirodnykh i laboratornykh usloviiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1971 No.300, p.137-152, In Russian. 35 refs. For translation see J-11775.

Supercooled sea water under laboratory conditions and in the Arctic and Antarctic under favorable conditions, occurring as open water with strong currents, low air temperature at the surface, and strong wind, was studied. The values of supercooling (the differences between liquid and freezing temperatures at the same salinity) in polynyas of Leningrad and Alasheyev Bights in the 0.5-m surface water layer range from 0.30 to 0.40 C, at the surface water film they reach 2.0C or more, and under the ice (Mirnyy region) the values decrease to 0.03 to 0.04C. In deep-water regions (Weddell Sea,

McMurdo Sound, and Davis Sea) supercooled water is found at depths of several hundred meters.

J-10442
Kats, A.L. ed
PROBLEMS OF CIRCULATION IN THE ATMOSPHERE AND HYDROSPHERE OF THE ATLANTIC OCEAN (A SUMMARY OF THE 1969 TRANSATLANTIC GREENLAND-ANTARCTICA CRUISE OF THE SCIENTIFIC RESEARCH SHIP PROFESSOR VIZE). Problemy tsirkuliatsii v atmosfere i gidrosfere Atlanticheskogo okeana (Itogi transatlanticheskogo reisa 1969 g. Grenlandiia-Antarktika na NIS "Professor Vize"). Leningrad, Gidrometeoizdat, 1970. 148p.. In Russian. Numerous refs.
QC880.P76

Eleven papers deal with problems of atmospheric circulation, and related wind and temperature regimes, and circulation, chemistry, and microbiology of the hydrosphere in the Atlantic Ocean. The data were obtained during the 5th cruise of the Professor Vize from 60 N to 60 S along the 30 W meridian from March 27 to July 4, 1969. Detailed analysis of processes in the atmosphere and hydrosphere based on simultaneous observations in both media was found to be very fruitful in explaining many phenomena of atmospheric circulation and weather in 1969. For abstracts of pertinent papers see: B-10446; I-10443, 10444; J-10445, 10447.

J-10445
Kriss, A.E.
HYDROLOGICAL STRUCTURE OF A WATER LAYER OF THE ATLANTIC OCEAN FROM GREENLAND TO ANTARCTICA ALONG 30 W (ACCORDING TO MICROBIOLOGICAL DATA). Gidrologicheskaia struktura vodnoi tolshchi Atlanticheskogo okeana ot Grenlandii do Antarktiki vdol' 30 z.d. (po mikrobiologicheskim dannym. Kats, A.I., (ed.), Problemy tsirkuliatsii v atmosfere i gidrosfere Atlanticheskogo okeana (Problems of circulation in the atmosphere and hydrosphere of the Atlantic Ocean), Leningrad, Gidrometeoizdat, 1970, p.96-100, In Russian. 5 refs.
QC880.P76

Data on heterotrophic microorganisms were used as an index in differentiating water of the equatorial-tropical from Arctic-Antarctic origin and in the vertical structure of water. Water samples for microbiological studies were collected by Nansen bathometers from 60 N to 60 S along 30 W at 21 deep-water stations from the following depths: 0, 10, 30, 50, 75, 100, 150, 200, 300, 500, 800, 1000, 1500, 2000, 3000, 4000, 5000, 6000, and 7000 m. The method and equipment used in the study are described. Unlike previous data from 50 to 70 S along 20 E and from the Arctic region the results show that sub-Antarctic waters at 30 W abound with microorganisms, especially at the 50-100 and 2000-3000-m profiles, which may be due to the richness in allochthon organic substances of the Brazil current.

J-10447
Fedorov, K.P.
SOME FEATURES OF BIOGENOUS ELEMENT DISTRIBUTION IN SUB-ANTARCTIC WATERS OF THE ATLANTIC OCEAN. Nekotorye osobennosti raspredeleniia biogennykh elementov v subantarkticheskikh vodakh atlanticheskogo sektora IUzhnogo okeana. Kats, A.I., (ed.), Problemy tsirkuliatsii v atmosfere i gidrosfere Atlanticheskogo okeana (Problems of circulation in the atmosphere and hydrosphere of the Atlantic Ocean), Leningrad, Gidrometeoizdat, 1970, p.126-135, In Russian. 9 refs.
QC880.P76

Hydrochemical investigations carried out during the 5th cruise of the Professor Vize in March-July 1969 between 30 and 60 S along 30 W show the distribution pattern of oxygen and biogenous elements (phosphates and silicic acid) in sub-Antarctic waters of the Atlantic Ocean. Comparisons with the 20 E meridional profile from 36 deg 30 min to 60 S by Soviet Antarctic expeditions in 1955-58 show high concentrations of biogenous elements throughout the depths of water in the southern parts of both profiles, perhaps, due to local divergences, which cause the uplifting of biological deep waters. The divergences occur because of bottom relief features and pressure fields typical of these regions.

J-10468
Ledenev, V.G.
COOLING OF COASTAL ANTARCTIC WATERS IN POLYNYAS OFF THE EDGE OF FAST ICE AND GLACIER TONGUES. Okhlazhdenie pribrezhnykh antarkticheskikh vod v raione zapripainykh i prilednikovykh polynei. Problemy Arktiki i Antarktiki, 1964 No.17, p.46-53, In Russian. 7 refs.

Data on evaporation, radiative flux into the atmosphere, and turbulent heat exchange in the region of Lazarev Station in 1959 were calculated to determine mean monthly heat loss by polynyas. The results show that mean monthly values of the heat loss of the near-glacier polynyas vary from 6-13 to 50-56 kcal/sq cm, 4 times more than in the Arctic. The effect of ice formation and subice supercooled water on heat loss is discussed. Sixteen successive ice formations off the fast ice and off the glacier tongues from Feb. to Aug. 1959 near Leningrad Bight were observed.

J-10476
Buscaglia, J.L.
CIRCULATION OF THE INTERMEDIATE WATER IN THE SOUTHWESTERN ATLANTIC OCEAN. Journal of marine research, Sept. 15, 1971 29(3), p.245-255, 15 refs.

In early studies of the Antarctic Intermediate Water in the South Atlantic it was assumed that the flow was mostly thermohaline and meridional. However, there is evidence that the wind-driven subtropical anticyclonic circulation in the South Atlantic Ocean extends to and includes the Intermediate Water, as in other oceans.

J-10480
Viau, B. , Cailleux, A.
FREQUENCY OF SEAMOUNTS IN PARTS OF THE INDIAN AND PACIFIC OCEAN. Fréquence des monts sous-marins dans une partie de l'Océan Indien et du Pacifique. Zeitschrift für Geomorphologie, Dec. 1971 15(4), p.471-478, In French with English summary. 27 refs.

Judging from the numbers found in the East Pacific Basin by Ménard (1959), the total number of circular or subcircular seamounts greater than 1000 m in elvation might be evaluated at about 22,700. Berthois's maps of the Southern Indian Basin were used to evaluate the frequency of seamounts. On a surface of 14,710,110 sq km, 629 seamounts of more than 500 m relative elevation were counted. According to the hypsometric curve the surface under the 500 m isobath is about 326,000,000 sq km. Taking into account the fact that 93,655 km of tracks were used in the Indian Ocean by Berthois and 7,400 in the Pacific Ocean by Menard, it is possible to

arrive at a total of 23,000 seamonts of at least 500 m, 3,800 of 1,000 m and 800 of 2,000 m of relative relief for all the oceans of the earth. Since most of these seamounts are probably submarine volcanoes, the importance of the seafloor as the principal domain of volcanism on the earth, is stressed.

J-10498
Lin'kova, T.I. , Lisitsyn, A.P.
PALEOMAGNETIC STUDY OF A LONG CORE FROM THE WESTERN PART OF THE INDIAN OCEAN. Paleomagnitnye issledovaniia dlinnoi kolonki iz zapadnoi chasti Indiiskogo okeana. Akademiia nauk SSSR. Doklady, Nov. 11, 1971 201(2), p.335-338, In Russian. 10 refs.

Paleomagnetic data from the longest cores, 1078 cm, of sea-bottom sediments, obtained by Soviet Antiarctic expeditions during 1955-59 in the western part of the Indian Ocean (42 deg 54 min S and 20 deg 06 min E), are given and compared to data on cores of the same length which had been taken previously in the same area. Along the entire length, the core samples consist of similar lithological elements, such as non-calcareous and non-siliceous silt-pelitic oozes. Stratigraphic analyses show 7 layers of direct and inverse polarities. A comparison of the core profiles and Cox's paleomagnetic scale indicates that the lower core layers are about 3 m.y. old. Microfloral and microfaunal remains in the bottom sediments suggest that Antarctic glaciation must be dated earlier than 4 m.y. ago.

J-10518
Scripps Institution of Oceanography
PHYSICAL AND CHEMICAL DATA FROM CRUISE 41 OF USNS ELTANIN IN SOUTHERN OCEAN BETWEEN AUSTRALIA AND ANTARCTICA, 20 DECEMBER 1969 - 16 FEBRUARY 1970. California. University. Scripps Institution of Oceanography, La Jolla. Report, 1972 SIO-Ref-72-19, 67p., AD-747 792

The primary purpose of Cruise 41 was to launch three Munk-Snodgrass internally recording tide capsules at 40, 50 and 60 degrees S along 132 degrees E (during the first leg) and to retrieve the capsules after they had spent approximately one month on the bottom (during the second leg). This data report presents only the hydrographic cast materials. (Auth.)

J-10519
Reid, J.L. , Lynn, R.J.
ON THE INFLUENCE OF THE NORWEGIAN-GREENLAND AND WEDDELL SEAS UPON THE BOTTOM WATERS OF THE INDIAN AND PACIFIC OCEANS. Deep-sea research, Nov. 1971 18(11), p.1063-1088, 44 refs.
GC1.D25

The bottom waters of the North Pacific and North Indian oceans have temperature and salinity distributions that suggest origins from the extreme waters of the Norwegian-Greenland and Weddell seas. These waters are traced from their sources to the abyssal Pacific and Indian oceans by examining distributions of temperature and salinity along a stratum defined by density parameters. The cold and saline water of the Norwegian-Greenland Sea is traced along the density stratum through the Denmark Strait, where vertical mixing raises both temperature and salinity to their maximum values in the central North Atlantic. From there the temperature and salinity decrease monotonically southward toward the Weddell Sea, partly by lateral mixing with the cold, low-salinity waters on this stratum where it lies near the sea surface in the Weddell Sea, and partly by vertical mixing with the underlying Antarctic Bottom Water. From the southern South Atlantic the high values of temperature and salinity (the stratum now lies close to the vertical maximum in salinity) extend eastward with the Antarctic Circumpolar Current into the Indian and Pacific oceans, with monotonically decreasing temperature and salinity as further vertical mixing erodes the maximum in salinity, until the salinity maximum is found at the bottom in the North Pacific Ocean. (Auth. mod.)

J-10583
Thompson, R.O.R.Y.
STRUCTURE OF THE ANTARCTIC CIRCUMPOLAR CURRENT. Journal of geophysical research, Dec. 29, 1971 76(36), p.8694, 2 refs.
QC811.J6

Callahan (1971; J-9829) shows that the total eastward flux of the circulation south of Australia is concentrated compared to the space available between Australia and Antarctica, or compared to the wind stress, and that this feature appears to be related to the topography of the region. Thompson (1971) shows that momentum transport by perturbations tends to cause baroclinic currents to be sharper where deeper water lies on the left (in the southern hemisphere). On the basis of this mechanism of current intensification by pertubation in the presence of suitable bottom topography, certain areas along the north flank of the southeast Indian rise where concentrated flow may occur are predicted. It is concluded that Callahan's observations fit well with the mechanism proposed by the author.

J-10642
Frakes, L.A. , Kemp, E.M.
GENERATION OF SEDIMENTARY FACIES ON A SPREADING OCEAN. Nature, March 1972 236(5342), p.114-117

Three dimensional relationships are studied among sedimentary facies that are simultaneously affected by seafloor spreading at varying rates, by migration of oceanographic boundaries due to climatic change or other causes, by variable sedimentation rates, and by migration of the entire ridge system. The purpose is to determine whether the shape and disposition of sedimentary units relative to their neighbors can be used to decipher problems in marine geology. Among other conditions analyzed, deposition on a ridge system is considered, one flank of which is spreading through a stationary oceanographic boundary, such as the Australia-Antarctic ridge spreading through the Polar Front or the East Pacific rise through the west margin of the Humboldt Current. Sediment type is different on either side of the barrier as a result of differing hydrographic conditions. Tongues of sediment are produced in response to reversals in direction of migration; they lie on opposite flanks if migration is across the ridge crest. Such a situation may have been in effect in the past on the Australia-Antarctic ridge; at present the Polar Front coincides closely with the ridge crest.

J-10688
Maksimov, I.V.
CAUSES OF THE INCREASE IN THE WORLD OCEAN LEVEL IN THE 20TH CENTURY. O prichinakh povysheniia urovnia Mirovogo okeana v tekushchem stoletii. Okeanologiia, May-June 1971 11(3), p.530-541, Eng. transl. in: Oceanology, 11(3):444-454, Feb. 1972. 23 refs.

An analysis of all available data shows that the World Ocean level has risen on the average by

6.10 cm during the last 50 yrs. It was generally believed that the rise has been associated with the melting of glaciers in Greenland and Antarctica. New hypotheses of the helio-gravitational background of the ocean level fluctuations are discussed on the basis of studies of variations in the pressure field of the Earth associated with the 11-yr solar activity cycle, annual water temperature variations, and iceberg distributions in the polar regions.

J-10691
Lang, J.
CONTRIBUTION TO THE STUDY OF THE SEDIMENTS OF THE GULF OF MORBIHAN (KERGUELEN ISLANDS). Contribution a l'étude sédimentologique du golfe du Morbihan (Iles Kerguelen). Comité national français des recherches antarctiques. CNFRA, 1971 No.29, 44p., In French with English and German summaries. 34 refs.
QE350.C62

Sediment analysis of the Gulf of Morbihan shows significant finds of powders and fine sands with sanidine, diatoms, and spicules of sponges, sands in the Royal Pass deposited by tidal currents, the absence of glacial material in the center of the bay, the localization of foraminifera, and the existence of lacustrine diatoms. The sediments are analogous to muds and loess but have neither quartz nor clay, however have a small amount of carbonates. In the Bolinder Fjord there is an eolian euxinic sediment. On the other hand a core sample shows a homogeneous sediment to a level of pumice with sanadine at a depth of 80 cm. A granulometric analysis extended to evaluation of cross-sections and medians shows a strong current coming from the East and mixing in the Royal Pass. Results of the study compare very well with those of studies in the South Indian Ocean, especially with results of Soviet expeditions. (Auth. mod.)

J-10694
Duedall, I.W.
OXYGEN DISTRIBUTION IN THE PACIFIC OCEAN. Journal of geophysical research, April 1971 77(12), p.2201-2203, 9 refs.

A Pacific Ocean oxygen section based on data collected during the Hudson 70 expedition is presented. The section is on the 150 W meridian and extends from 63 S. to 55 N. The main features shown are the Antractic intermediate water, the South Pacific deep water, and the Pacific intermediate water. The oxygen features described are consistent with features reported by Reid (1965; J-4277). Also shown in the section is evidence for the reported bottom current that flows east around Hawaii (Edmond, Chung, and Sclater, 1971). (Auth. mod.)

J-10696
DEEP SEA DRILLING; THREE YEAR EXTENSION. Nature, April 1972 236(5345), p.258

The National Science Foundation has announced that the Deep Sea Drilling Project (DSDP) ship, Glomar Challenger, will continue drilling into ocean floors until Aug. 1975, and that it will take samples from previously uncharted areas. The extension of the project will take the Glomar Challenger into Arctic and Antarctic waters for the first time and into the Red Sea. An objective of the mission will be to probe the geology of the Antarctic. It is likely that the date at which Australia broke away from Gondwanaland will be clarified.

J-10767
McIntyre, A. , Ruddiman, W.F., Jantzen, R.
SOUTHWARD PENETRATIONS OF THE NORTH ATLANTIC POLAR FRONT; FAUNAL AND FLORAL EVIDENCE OF LARGE-SCALE SURFACE WATER MASS MOVEMENTS OVER THE LAST 225,000 YEARS. Deep-sea research, Jan. 1972 19(1), p.61-77, 39 refs.
GC1.D25

In reconstruction of climatic shifts based on core assemblages of Foraminifera and Coccolithophorida taken on the Mid-Atlantic Ridge, comparative data indicates: (1) carbonate maxima occur in belts centered on the Antarctic Convergence, (2) ecological data collected by Be differs in the N. and S. Hemispheres and precludes using Foraminifera for extrapolations of paleotemperatures at high latitudes, (3) in using geographic groupings of species, Antarctic plankton data suggests that Globorotalia inflata is a "transition" species to be compared with polar and subpolar species; G. truncatulinoides ranges into much colder waters near Antarctica than in N. Atlantic plankton but has consistently inhabited warmer waters, (4) the O-18/O-16 ratios in the glacial ice of Greenland and Antarctica are correlative with solar insolation curves. For the main purpose of this paper, the evidence points to over 106 latitudinal climatic shifts during the late Pleistocene time, and a conclusion that the four conceptual continental glacial eras fail to include major shifts found in the deep-sea core data.

J-10774
Deacon, G. ed.
SYMPOSIUM ON ANTARCTIC ICE AND WATER MASSES, TOKYO, JAPAN, 19 SEPTEMBER 1970. Cambridge, Scientific Committee on Antarctic Research, 1971, 113p., Numerous refs.
GB2597.S93

This symposium resulted from a request that SCAR organize a half-way symposium on some aspects of Antarctic Oceanography with the objective of bringing to the attention of a wide oceanographic audience the complexity of interesting problems of Antarctica in the hope that more of the world's leading marine scientists would be stimulated to undertake more studies in the southern oceans. The 8 papers presented at the symposium are divided among 4 sections with the following headings: Section 1. General Circulation of Antarctic Water Masses and its Relationship to Surrounding Oceans; Section 2. Bottom Water, Origins and Motions; Section 3. The Pack Ice Zone; and Section 4. Physiology of Organisms at Low Temperatures. For abstracts of the papers see J-10775 to J-10782. It is hoped that the symposium will provide an indication of areas in which enhanced international activity is required and stimulate interest in holding a second international symposium devoted to high latitude oceanography. For the first Symposium on Antarctic Oceanography, 1966 see J-6717.

J-10775
Gill, A.E.
THEORETICAL MODELS AND ASPECTS REQUIRING FURTHER INVESTIGATION. Symposium on Antarctic Ice and Water Masses, Cambridge, Scientific Committee on Antarctic Research, 1971, p. 3-7, 6 refs.

Theoretical examination of the Antarctic circumpolar current, meridional circulation, and the movements of Antarctic water masses demonstrates the importance of geometry for circulation. The gross features of the bathymetry around Drake Passage are particularly

important, namely the fact that the current is forced to flow through a narrow passage, and secondly that the nearby Scotia ridge tends to block off the deeper water. Vertical transport in a model incorporating barriers corresponding to South America and the Antarctic Peninsula is considerably less than that of the wind-driven flow in a zonal channel, because of the blocking effect. The inclusion of the blocking effect of these barriers is considered essential in constructing models of the circumpolar current. Consideration of three different geometries (closed, full gap, and half gap) for meridional circulation give three different solutions even though the wind stress and surface temperature variations are the same. The numerical model of the meridional circulation patterns for the three cases suggests that Antarctic Intermediate water is formed because of Drake Passage. Horizontal transport for the three cases is also considered.

J-10776
Mosby, H.
SOUTH ATLANTIC BOTTOM WATER. Symposium on Antarctic Ice and Water Masses, Cambridge, Scientific Committee on Antarctic Research, 1971, p. 11-20, 21 refs.

Meteor data from the South Atlantic are used to investigate the mechanism of Antarctic bottom water formation and the vertical diffusion process. As shown by Wust (1933) the Antarctic bottom water flows northwards mainly in the west along his Main (Western) Section while in the east it can pass only to the Walfish ridge. In 30 S it flows through a narrow passage through the Rio Grande ridge into the Brasilian Basin, where it is nearly trapped. The vertical distribution of potential temperature and of salinity is plotted for 13 positions along the Main Section. From computations of the flow pattern in the Brasilian Basin, the total amount of bottom water from the Weddell Sea area which is transformed in the Atlantic is estimated to be 20,000,000 cu m/sec or 700,000 cu km/yr. There are indications that the whole of this volume may be emptied three times a yr, or in a new concept, heavy shelf water moving along the ice cap on the shelf may be considered as being three times more effective in producing bottom water.

J-10777
Lewis, E.L. , Weeks, W.F.
SEA ICE: SOME POLAR CONTRASTS. Symposium on Antarctic Ice and Water Masses, Cambridge, Scientific Committee on Antarctic Research, 1971, p. 23-34, 44 refs.

Comparisons are made between the following features of Arctic and Antarctic sea ice: extent, age, and thickness of the ice cover; structure of the ice and the underlying water column; mechanical properties; and wave action. The Antarctic has the most extensive ice cover, the largest annual variation in the extent of ice cover, the thickest first year ice, and the thickest multi-year sea ice that is actively growing-- the shelf-like tongue of the Koettlitz Glacier. The largest heavy ice concentrations occur in the Weddell and Bellingshausen Seas. Structural details of the congelation sea ice at McMurdo Sound and at Barrow, Alaska are similar; however Antarctic sea ice possesses additional ice layers with differnt crystal structures both above and below the congelation ice. It is postulated that production of both congelation ice and underwater ice is the direct result of heat loss through the ice sheet. Available results indicate that congelation ice from the Arctic and Antarctic has similar mechanical properties. The need for futher study of the relation between the ice pressure in the Antarctic pack ice and gravity wave attenuation is suggested.

J-10778
El-Sayed, S.Z.
BIOLOGICAL ASPECTS OF THE PACK ICE ECOSYSTEM. Symposium on Antarctic Ice and Water Masses, Cambridge, Scientific Committee on Antarctic Research, 1971, p. 35-54, 53 refs.

Antarctic pack ice is more widely distributed during the winter season. Important physical and chemical parameters influencing the distribution and abundance of the biota in the pack ice and sea ice regimes include light, temperature, salinity, dissolved oxygen, hydrogen ion concentrations, and inorganic salts. Light transmission is correlated with the biological activities of epontic photoplankton on the ice undersurface. Trophic relationships in pack ice are briefly discussed. Minimum salinity occurs during late summer. Dissolved oxygen reflects the biological role of summer phytoplankton and pH increases in response to summer photosynthesis. Nutrient salts are variable, but abundant. Primary productivity in pack ice is remarkably high. Growth of diatoms appears to result almost entirely from photosynthesis. Besides its microalgae flora, the ice community is also composed of ice and sub-ice fauna, cryopelagic fishes, and bottom fauna. The physical characteristics of the environments are critical to the distribution and abundance of benthic fauna. Assessment of these stresses in structuring the shallow-water benthic community at McMurdo Sound has resulted in a vertical zonation of the dominant sessile organisms. It appears that with increasing physical stability the macroscopic epifauna and microscopic infauna become more abundant and diverse. Tropic relationships in pack ice are briefly discussed.

J-10779
Erickson, A.E. , Siniff, D.B., Cline, D.R., Hofman, R.J.
DISTRIBUTIONAL ECOLOGY OF ANTARCTIC SEALS. Symposium on Antarctic Ice and Water Masses, Cambridge, Scientific Committee on Antarctic Research, 1971, P. 55-76, 35 refs.

The true seals of the Antarctic are represented by four species, all circumpolar in distribution -- Crabeater (most abundant), Weddell, Leopard, and Ross Seals. Two species, also found in Antarctic waters, whose distributional orientation is primarily Subantarctic are the Southern Elephant and Southern Fur Seals. Census data showed Crabeater Seals to be overwhelmingly predominant (96.9 percent) in the Weddell Sea. Weddell Seals constituted 2 percent and Leopard Seals 1 percent. Only four Ross Seals were observed during the 3 yr of census. The mode count values for 1968 and 1969 were 1.87 and 3.34 seals per nautical sq mi, respectively. The peak haul-out period extended from approx 1100 to 1400 hr. Rectal temperature fluctuations in two Crabeater Seals could be correlated with the daily activity pattern. Estimates of Crabeater Seals in the Weddell Sea yielded population values of 8,246,800 for 1968 and 10,597,500 for 1969. Investigations of the relationship of seal density, ice type, and ice coverage demonstrated the preference of Crabeater Seals for cake and small floe ice types in the 2-5 octa coverage range. The mean composite pod size for 1968, 1969, and 1970 was 2.1 seals. Counts of Weddell, Leopard, and Ross Seals for all 3 yr combined were 95, 44, and 4, respectively. Other aspects of the studies are summarized.

J-10780
Seal, U.S. , Erickson, A.W., Siniff, D.B., Hofman, R.J.
BIOCHEMICAL, POPULATION GENETIC, PHYLOGENETIC AND CYTOLOGICAL STUDIES OF ANTARCTIC SEAL SPECIES. Symposium on Antarctic Ice and Water Masses, Chambridge, Scientific Committee on Antarctic Research, 1971, p. 77-95, 20 refs.

Biochemical studies are reported on six species of Antarctic Pinnipedia -- Crabeater (Lobodon carcinophague) Weddell (Laptonychotes Weddelli), Leopard Hydruga peltonyx), Ross Ommatophoca rossi), Elephant Mirounga leonina and Fur (Arctocephalus tropicalis) The studies serve to suggest problem areas in seal studies and to demonstrate the importance of testing and developing molecular concepts of the evolutionary process in mammals. It is evident that protein and enzyme polymorphisms occur in the these species and that these techniques will provide information of value for identification of isolated breeding populations as in Leptonychotes, or for inferring homogeneity of the population as in Lobodon. Samples from each of the new populations studied are desirable to determine the overall population structure of the species and to seek correlates with habitat and life patterns. The process of speciation in the Pinnipedia and their phylogenetic history also offer unresolved problems which can be approached by continuing the study of their hemoglobins and selected serum proteins. Especially desirable are specimens from the remaining species which have not been studied in order to get a complete picture of the phylogenetic history of this group.

J-10781
Deacon, G.E.R.
PROBLEMS OF THE PACK ICE ZONE. Symposium on Antarctic Ice and Water Masses, Cambridge, Scientific Committee on Antarctic Research, 1971, p. 96-98

The relative lack of observations on the continental slopes is ascribed to pack ice and low temperatures in winter that make work difficult and to higher priorities given to land explorations in summer. Progress is likely to be slow until the work is given as much thought as for mid-ocean dynamics in the N. Atlantic Ocean, and given techniques as advanced as those recently used for investigating the bottom water in the Gulf of Lions. In discussing the problems, a summary is given of the formation of Antarctic bottom water and the contribution made by the dynamics of the Drake Passage, Antarctic Convergence, Weddell Sea, and Ross Sea. Modified ice-breakers, ice island techniques, under-ice powered towing and homing devices, and satellite photography are suggested to supplement the present setup for Antarctic continental slope exploration.

J-10782
DeVries, A.L. , Somero, G.N.
PHYSIOLOGY AND BIOCHEMISTRY OF LOW TEMPERATURE ADAPTATION IN ANTARCTIC MARINE ORGANISMS. Symposium on Antarctic Ice and Water Masses, Cambridge, Scientific Committee on Antarctic Research, 1971, p. 101-113, 27 refs.

The relative abundance of homeotherms and poikilotherms in the polar oceans indicates that these forms have successful in evolving adaptation for survival in this environment. For homeotherms, there seem to have been few basic changes in the metabolic biochemistry with regard to cold adaptation of enzyme proteins, serum constituents, etc. Instead, the internal milieu has been maintained within "typical" homeotherm limits of temperature, osmolarity, etc., while the buffering zone between the internal milieu and the environment, namely the skin layer with attendant insulation structures, has been drastically and adaptively changed. Aquatic poikilotherms have had to make numerous changes in their biochemical systems. Most notably, they have evolved unique molecular fluids, and enzyme proteins which exhibit the abilities to catalyze metabolic transformations at temperatures which prove lethal for the vast majority of living species.

J-10873
Seto, Y. , Saruwatari, R.
OCEANOGRAPHIC DATA OF THE 11TH JAPANESE ANTARCTIC RESEARCH EXPEDITION 1969-1970. Antarctic record, Dec. 1971 No.42, p.89-102

Oceanographic data from observations made on board the icebreaker Fuji during the summer mission of the 11th Japanese Antarctic Research Expedition are given. The data include current measurements, surface, bathythermograph, vertical (serial), and salinity-temperature-depth observations, and chemical analyses of sea water. The locations of the observation stations and track chart of the cruise are shown.

J-10874
Nakabayashi, S. , Seto, Y.
OCEANOGRAPHIC DATA OF THE 12TH JAPANESE ANTARCTIC RESEARCH EXPEDITION 1970-1971. Antarctic record, Dec. 1971 No.42, p.103-123

Oceanographic data from observations made on board the icebreaker Fuji during the summer mission of the 12th Japanese Antarctic Research Expedition are given. The data include current measurements, surface, bathythermograph, vertical (serial), and salinity-temperature-depth observations, and chemical analyses of sea water. The locations of the observation stations and track chart of the cruise are shown.

J-10906
Evseev, V.V.
EXPERIENCE IN THE USE OF AN ELECTRONIC ATTACHMENT TO THE TIDE GAGE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.425-427, Translated from its Informatsionnyi biulleten' No.75, 1969.

Q115.S6862

The addition of a recording electronic potentiometer to a tide gage system enabled observations on sea level fluctuations to be made at Molodezhnaya Station for 7 mos in the winter of 1965-1966 without interruptions. The meter was developed to overcome difficulities, such as bad weather, freezing of ice holes, interference of seals, and ink supply running out. Malfunction of the tide gage can be spotted immediately by having a remote attachment with a recording electronic potentiometer in the hydrologist's room. The operating principle of the attachment is described in detail.

J-10912
IArogov, B.A.
YEAR-TO-YEAR WATER TEMPERATURE VARIATIONS IN THE SOUTHERN PART OF THE SCOTIA SEA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.441-442, Translated from its Informatsionnyi biulleten' No.76, 1969.

Q115.S6862
Hydrological surveys were carried out by Soviet marine expeditions in the Scotia Sea on the same dates in different years to determine the year-to-year variations of water temperature. Data are given on the mean temperature of the 0- to 200-m layer N of the South Orkney Is. for 1963, 1965, 1967, and 1969, as well as those along the 55 deg W profile between 57 deg and 60 deg 30 min S. The results show that the water temperature and closely associated with it, biological productivity vary noticeably from year to year.

J-10917
Fedotov, V.I.
INFLUENCE OF SURF ON THE FORMATION OF THE ICE BARRIER IN ALASHEYEV BIGHT. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.460-463, Translated from its Informatsionnyi biulleten' No.76, 1969. 5 refs.
Q115.S6862
Oceanographic and glaciological surveys conducted in Alasheyev Bight near Molodezhnaya Station were to help safeguard mooring installations and ships unloading at the sea barrier from the danger of waves and sea ice during a rough sea, and to determine the influence of surf on the formation of the ice coast. Observations carried out by the 11th Soviet Antarctic Expedition showed that swell and wind waves greatly affected the ice barrier, especially during the strong autumn storms of 1966. The destructive effect of waves is great, particularly that of waves carrying ice masses weighing 4-5 tons. Surf that floods the coast during a storm erodes the barrier, yet in some degree reinforces it by freezing the sea water in the snow-firn layer. Further studies are needed on the role of surf in coast formation and on the action of the various forces involved.

J-10927
Schornick, J.C., Jr.
URANIUM AND THORIUM ISOTOPE GEOCHEMISTRY IN FERROMANGANESE CONCRETIONS FROM THE SOUTHERN OCEAN. Florida. State University, Tallahassee. Sedimentological Research Laboratory. Contribution, May 1972 No.34, 161p., Doctoral thesis. 116 refs.
Uranium and thorium in Southern Ocean Fe/Mn concretions are almost totally authigenic. Some of the uranium, U-234 in particular, may be of volcanic origin, but the vast majority is of normal sea water origin. The deposition of both uranium and thorium is controlled by the scavenging action of colloidal iron. Accumulation rates range from 5 mm/10 exp 6 yr to almost 70 mm/10 exp 6 yr, a factor of seven greater than reported for modules from other parts of the Pacific. Accumulation rates north of 50 deg S are uniform and slow, while south of this line the rates are much faster and variable. The disequilibrium data suggest that the Th-230/Th-232 ratio method is valid for absolute dating of Fe/Mn concretions. Although Fe/Mn concretions appear to have high concentrations of uranium and thorium compared to deep sea sediments the rate of accumulation of the elements per unit area in the Fe/Mn concretions is much less than in the sediments.

J-10930
Weaver, F.M. , Wise, S.W., Jr.
ULTRAMORPHOLOGY OF DEEP SEA CRISTOBALITIC CHERT. Nature physical science, May 22, 1972 237(73), p.56-57, 14 refs.
Q1.N22
Studies of the ultramorphology of deep sea cristobalitic cherts from the Atlantic, Pacific and Southern Ocean basins show the cristobalite to be an authigenic mineral consisting of fine blades which grow in spherules of diam 3 to 10 micrometers. A white monomineralic chert from the Southern Ocean recovered by Eltanin (core 47-15) is the first deep sea chert reported from the Antarctic, and consists almost entirely of 10 micrometer cristobalite spherules except for rare, heavily etched fragments of diatom frustules. The blades that make up the spherules are 300 to 500 angstroms thick and appear cryptocrystalline when examined under the petrographic microscope. Electron micrographs show, however, that the blades have a well developed crystalline form. This, together with the free growth surfaces of the spherules, proves that the cristobalite is an authigenic mineral formed by chemical precipitation rather than through a solid state conversion of biogenous silica. The absence of volcanic products in the chert shows that it can be derived entirely from biogenous silica.

J-10934
Weser, O.
DEEP SEA DRILLING PROJECT - PAST AND FUTURE. Marine technology society. Journal, Nov.-Dec. 1971 5(6), p.20-22
GC1.J63
In August 1971, under contract with the National Science Foundation, the Deep Sea Drilling Project began its fourth year of a continuing program of deep ocean drilling revolving around a series of two-month cruises of the Glomar Challenger. During the first two years of the program, noteworthy scientific discoveries were made through an analysis of the cores recovered during Legs 1 through 12, many of which have been published. The track chart and findings of Legs 13 through 18 are presented. Plans for an additional three-year drilling program include extensive work in higher latitude regions with particular emphasis on the Antarctic ocean where severe climatic conditions are expected to tax drilling capabilities.

J-10935
Spencer, D.W. , Bainbridge, A.
GEOSECS: A PROGRAM FOR THE INTERNATIONAL DECADE OF OCEAN EXPLORATION. Marine technology society. Journal, Nov.-Dec. 1971 5(6), p.23-26
GC1.J63
The basic purpose of the Geochemical Ocean Sections Program (GEOSECS) is the detailed measurement of the oceanic constituents along Arctic to Antarctic sections at all depths, to provide, for the first time, a set of physical and chemical data measured on the same water samples. These data will provide knowledge of the stirring and mixing processes in the deep sea, the interchange of material between deep and surface water, the variation of organic productivity throughout the ocean, the exchange of water and gases with the atmosphere and the levels of pollutants and of fission and waste products being added to the sea. The operation of the program is focused around three major cruises: Atlantic cruise, July 1972 to Mar. 1973; Pacific cruise, June 1973 to Mar. 1974, and a separate Indian Ocean leg starting in 1975. Much of the analytical work will be done directly on the ships during the expedition. The proposed cruise tracks and stations are shown and plans for a series of hydrographic and sampling casts at each station are outlined.

J-10938
Lynn, R.J.
ON POTENTIAL DENSITY IN THE DEEP SOUTH ATLANTIC OCEAN. Journal of marine research, May 15, 1971 29(2), p.171-177. 10 refs.
GC1.J6

There is a great contrast between the relative distributions of potential density referred to 0 decibars and of potential density referred to 4000 decibars in the deep water of the South Atlantic Ocean. Both parameters are useful in a descriptive analysis of deep water; the former is an identifier of water origin, the latter graphically displays stability in the deep ocean and can be used to infer deep-ocean geostrophic flow.

J-10941
Papanin, I.D. , Suziumov, E.M.
DEVELOPMENT OF THE SOVIET RESEARCH FLEET. Oceanology, 1971 (Publ. May 1972) 11(5), p.654-659, Translated from Okeanologiia.
GC1.03913

The history of the development of the Soviet research fleet from 1922 to the present time is reviewed. Three periods are distinguished: the prewar period, when research was conducted primarily on icebreakers, freighters, and fishing trawlers, and was limited to marginal seas; the second period is closely associated with the Vityaz' (after 1948), when Soviet oceanology penetrated into the Pacific Ocean, and participated actively in the IGY and in the IQSY in both hemispheres, including the Antarctic region. The Ob', which was refitted into a scientific transport vessel of the diesel-powered Lena class, is now participating in her 16th Antarctic voyage. The third period - the contemporary period - is associated with the construction of the Akademik Kurchatov class of vessels (1966), and of entire groups of various types of research vessels, including oceanographic vessels, "weather ships," survey ships, and the like.

J-10942
Treshnikov, A.F.
OCEANOLOGICAL INVESTIGATIONS IN THE ARCTIC AND ANTARCTIC DURING THE SOVIET REGIME. Oceanology, 1971 (Publ. May 1972) 11(5), p.684-689, Translated from Okeanologiia. 3 refs.
GC1.03913

Physical oceanographic investigations performed in the polar regions by Soviet scientific organizations, mainly the Arctic and Antarctic Scientific Research Institute, are reviewed. Oceanographic studies conducted in the Southern Ocean are reflected in the two volumes of the Antarctic Altas. Data obtained from artificial satellites have been successfuly used by Soviet Antarctic expeditions for sea-ice investigations. The future research tasks in Arctic and Antarctic waters are outlined, covering interactions between the ocean and atmosphere, part of the Polar experiment which is proposed as a component of the Global Atmospheric Research Project (GARP).

J-10945
Klenova, M.V.
FIFTY YEARS OF SOVIET MARINE GEOLOGY. Oceanology, 1971 (Publ. May 1972) 11(5), p.703-709, Translated from Okeanologiia. 1 ref.
GC1.03913

Geological studies of the sea floor carried out by the Soviet scientists since 1921, first in adjacent seas of the U.S.S.R. and in the post-war period, especially during the IGY, in the World Ocean are reviewed, showing four developmental stages. The Antarctic Expedition of 1955-1958 aboard the Ob' and Lena investigated the ocean floor morphology and collected bottom sediments and suspended matter over the entire region of the Southern Ocean. The Antarctic shelf was found to be at a lower level than the others, the concept of "dispersion areas" of clastic material was placed on a solid foundation, the limits and geologic significance of these areas were established, the types of bottom deposits were described, and maps of the ocean floor were drawn. The present state of geological investigations and the main tasks for futher research in marine geology are discussed.

J-10959
Bogdanov, K.T.
DISTRIBUTION OF TIDAL WAVES IN THE ANTARCTIC OCEAN. Antarctic (Antarktika), 1971, p.91-102, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 15 refs.

Cotidal maps of the tidal wave components M2, S2, K1, and O1 are constructed by the isohypse method, using data from 21 coastal Antarctic and 17 sub-Antarctic island points. At 40 S, the harmonic constants were taken from tidal maps of the Atlantic, Indian, and Pacific Oceans. The maps do not achieve high accuracy, due to the small number of measurements, although rough estimates of heights and times of onset of high and low tides are possible. The values of isoamplitudes on the cotidal maps can be used to calculate the features of all tides in Antarctic waters. A tidal map indicates that semidiurnal and irregular semidiurnal tides predominate in Antarctic waters: irregular diurnal tides are found only in the Indian Ocean sector and in the Ross Sea. (For Russian original see J-5043)

J-10974
Ivanov, IU.A. , Neiman, V.G.
FRONTAL ZONES OF THE SOUTHERN OCEAN. Antarctic (Antarktika), 1971, p.157-174, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 14 refs.

The positions of frontal zones in Antarctic waters have been previously determined according to the maximum gradients of water temperature and salinity. These aspects do not define the convergences and divergences, but merely characterize the physical fronts which accompany them. The actual comvergence or divergence is a dynamic front at which the vertical component (upward at the divergence, downward at the convergence) of current velocity reaches its maximum along a meridional plane. The relationships of dynamic fronts to air pressure zones, tangential wind stress, and hydrological characteristics are discussed. Formulas are given for calculating the total vertical current rate. The positions of four frontal zones (the Antarctic Divergence, the Antarctic Convergence, the sub-Antarctic Divergence, and the sub-Antarctic Convergence) have been determined from hydrological measurements taken along 86 meridional sections, and are shown on a map. These observations were made during various years and seasons; therefore, the accuracy of the map is dependent on the magnitude of seasonal and yearly variations. A cross section along 20 deg E from 35 deg to 70 deg S illustrates the relationship of these dynamics fronts to temperature and salinity distributions. For Russian original see J-4545.

J-11025
Fillon, R.H.
EVIDENCE FROM THE ROSS SEA FOR WIDESPREAD SUBMARINE EROSION. Nature physical science, July 17, 1972 238(81), p.40-42
Q1.N22

Benthic foraminiferal faunas from surface sediments of 64 Eltanin piston cores were examined. Five foraminiferal depth zones were observed, three in the Ross Sea region and two in deeper waters to the north. In deeper waters, calcareous benthonic foraminiferal assemblages were restricted to sediment older than lower Matuyama. Regional disconformity separated late Brunhes sediments containing arenaceous benthic foraminiferal faunas to all depths from sediments older than the Olduvia Event. Widespread disconformity occurred in less compacted Matuyama sediment containing less ice rafted material while coarse, compacted, ice rafted Gauss age sediment was difficult to penetrate and resisted bottom current erosion. A decrease in debris in the area explained the change in sedimentation. It is concluded that changes in the circulation of the sub-Antarctic and Antarctic South Pacific are related to variations in the production of bottom water in the Ross Sea and to fluctuations of the Ross Ice Shelf. The decrease in abundance of ice-rafted sediment in the Ross Sea, begun in the latest Gauss, is reflected in Southern Ocean sediments over a wide area. The changeover from a dominantly calcareous to a dominantly arenaceous benthic foraminiferal fauna completed by the late Matuyama implies that a shallowing of the calcium carbonate compensation depth took place in the Ross Sea. Corresponding shallowings of the calcium carbonate lysocline and compensation depth may have occurred in other parts of the ocean. Sedimentological and palaeontological changes in the Ross Sea during the Late Cainozoic could thus be important in determining palaeo-oceanographic history.

J-11029
Barker, P.F.
SPREADING CENTRE IN THE EAST SCOTIA SEA. Earth and planetary science letters, June 1972 15(2), p.123-132, 24 refs.
QE1.E12

Satellite-fixed magnetic and bathymetric data confirm the presence of a spreading center in the east Scotia Sea behind the South Sandwich island arc and trench. Spreading is slightly asymmetric, favouring the eastern, island arc side, and the total spreading rate has increased from 5 to 6 cm/yr 4 Ma ago, to 7 to 9 cm/yr at present. The close similarity between this feature and the signs of secondary extension found in the marginal basins of the Western Pacific suggests that the usual Vine-Matthews anomalies may be found there also.

J-11039
Jacobs, S.S. , Bruchhausen, P.M., Rosselot, F.L., Gordon, A.L., Amos, A.F., Belliard, M.
ELTANIN REPORTS. CRUISES 37-39, 1969; 42-46, 1970: HYDROGRAPHIC STATIONS; BOTTOM PHOTOGRAPHS; CURRENT MEASUREMENTS; NEPHELOMETER PROFILES. Columbia University. Lamont-Doherty Geological Observatory. Technical report, 1972 TR 1-CU-1-72, 490p., 43 refs.

Hydrographic data taken aboard the USNS Eltanin, cruises 37, 39, and 42-45, in southern oceans during 1969 and 1970 are described and listed. Hydrographic stations continuously recorded in situ salinity-temperature-depth (STD) measurements, serial casts and surface-command bottle observations. Water samples were processed for salinity and oxygen on all cruises and additionally for nutrients on cruise 37. Mechanical and expendable bathythermograph casts at 275 and 700 meters, respectively, were concentrated in the Polar Front (Antarctic Convergence) region. Bottom photographs, light scattering (nephelometer) and current meter recordings were taken and continuous sea-surface temperature records were made over portions of the ship's track. During cruise 37, samples were collected for measurement of radium, uranium, partial pressure of carbon dioxide and total carbon dioxide in sea water, trace elements and total carbon dioxide content of sediment porewater, geochemical studies of oceanic ridge material, and isotope ratios in living foraminifera. Total carbon dioxide samples were also taken on cruises 42 and 43.

J-11048
Hahnel, G.
JOIDES: PAST, PRESENT AND FUTURE. Nature physical science, April 10, 1972 236(67), p.81
Q1.N22

With an expedition to the southern seas recently completed, the drilling ship Glomar Challenger of the Joint Oceanographic Institutions for Deep Earth Sampling JOIDES has been operating in the Arabian Sea and is now continuing its voyage with a visit to the Red Sea. At the same time, plans have been announced for at least five 56-day cruises spanning three austral summers in Antarctic waters. The general objectives of the Antarctic expeditions are to: 1) obtain further data on the chronology of Gondwanaland, but with the added possibility of finding oceanic crust older than the Gondwanaland breakup; 2) study the volcanic, glacial, and climatic history of Antarctica by means of drilling; 3) investigate Antarctica as a sediment source, partly with a view to elucidating the formation of Antarctic bottom water; and 4) determine the tectonic history of the Antarctic margin, subantarctic ridges, and islands.

J-11064
Ahrens, L.H. , Press, F., Runcorn, S.K., Urey, H.C. eds
PHYSICS AND CHEMISTRY OF THE EARTH. VOLUME 8. Oxford, Pergamon Press Ltd., 1971, 337p., Numerous refs.
QE501.P53

The major part of this volume is a detailed account of Lamont Geological Observatory studies on sediment transport and distribution in the Argentine Basin. The first two reports discuss the circulation of the Antarctic Bottom Current in the Argentine Basin and establish that this powerful western boundary current is capable of creating large depositional and erosional sedimentary features, and of tranporting large amounts of lutite in suspension. The third paper explains the origin of the homogeneous sediments by the transport and deposition of the lutite in suspension in the nepheloid layer under the control of bottom water circulation and establishes that the present process of sedimentation and bottom water circulation have been essentially the same throughout the whole Cenozoic era. The fourth paper explores the relative importance of turbidity current deposition during the history of the basin and shows in particular two main phases, the most recent being Pleistocene, and the other pre-Cenozoic. The fifth and sixth papers examine the sedimentary structure of the Argentine Margin and Basin, and scientific exploration of the basin,

respectively. Two other reports in this volume deal with the chemical composition of basaltic achondrites and environmental influences on the chemical composition of shales and clays. For abstracts of pertinent papers see 11065 to 11070.

J-11065
Le Pichon, X. , Eittreim, S.L., Ludwig, W.J.
SEDIMENT TRANSPORT AND DISTRIBUTION IN THE ARGENTINE BASIN. 1. ANTARCTIC BOTTOM CURRENT PASSAGE THROUGH THE FALKLAND FRACTURE ZONE. Physics and chemistry of the Earth, 1971 Vol.8, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1425, p.1-28, 22 refs.
QE501.P53

The southern boundary of the Argentine Basin is formed by a nearly continuous basement high consisting of the Falkland Plateau scarp and its eastward extension, the Falkland Fracture Zone. A major gap in the fracture zone near 36 deg W serves as a passage for the Antarctic Bottom Current (AABC) into the Argentine Basin. The path, velocity and transport of the AABC are determined using different geophysical techniques, including bottom current measurements and geostrophic calculations. A system of channels and a large depositonal sedimentary ridge, the Zapiola Ridge, are related to the pattern of flow of the AABC through this region during most of the Cenozoic era.

J-11066
Le Pichon, X. , Ewing, M., Truchan, M.
SEDIMENT TRANSPORT AND DISTRIBUTION IN THE ARGENTINE BASIN. 2. ANTARCTIC BOTTOM CURRENT PASSAGE INTO THE BRAZIL BASIN. Physics and chemistry of the Earth, 1971 Vol.8, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1426, p.29-48, 18 refs.
QE501.P53

The Rio Grande Rise is a major boundary between the Argentine Basin and the Brazil Basin. The only topographic break between Brazil and 30 deg W is a narrow gap along 40 deg W, the Rio Grande Gap. Within the gap, a 650-km long channel, called the Vema Channel, is cut as much as 700 m below the adjacent sea floor and provides a 4700 m deep passage for the Antarctic Bottom Current (AABC). The channel has been cut by the AABC and its history goes as far back as Late Mesozoic when the present regime of bottom water circulation was probably established. The velocity and transport of the AABC through the channel are computed and lead to an estimate of the transport of sediment in the AABC from the Argentine Basin into the Brazil Basin.

J-11067
Ewing, M. , Eittreim, S.L., Ewing, J.I., Le Pichon, X.
SEDIMENT TRANSPORT AND DISTRIBUTION IN THE ARGENTINE BASIN. 3. NEPHELOID LAYER AND PROCESSES OF SEDIMENTATION. Physics and chemistry of the Earth, 1971 Vol.8, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1427, p.49-77, 23 refs.
QE501.P53

The morphology of the floor of the Argentine Basin is the result of current control of sedimentation by the Antarctic Bottom Current (AABC). The AABC which follows the western boundary of the basin has velocities generally greater than 10 cm/sec. Such velocities are great enough to prevent or inhibit depositon of lutite along its axis, resulting in the topographic depression along the southwestern boundary of the basin. The bulk of the clays in suspension are eventually deposited on the lutite-comprised Argentine Rise in the central part of the basin. A layer of intense light scattering (nepheloid layer) about 1 km thick is present at the bottom of the water column over the whole basin, is identified with the Antarctic Bottom Water (AABW), and presumably represents the suspended clays which are being transported in the AABW. The central lutite area is characterized by large undulations of of the sea floor of about 5 km wave-length, here called "giant ripples". These giant ripples are repeated as sub-bottom reflections showing a distinct direction of migration through time and are interpreted as recording the directions of sediment transport in the basin. The present sedimentation process, that of control of sedimentation by the AABC, has been active and remarkably constant for all of Cenozoic time.

J-11068
Lonardi, A.G. , Ewing, M.
SEDIMENT TRANSPORT AND DISTRIBUTION IN THE ARGENTINE BASIN. 4. BATHYMETRY OF THE CONTINENTAL MARGIN, ARGENTINE BASIN AND OTHER RELATED PROVINCES, CANYONS AND SOURCES OF SEDIMENTS. Physics and chemistry of the Earth, 1971 Vol.8, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1428, p.79-121, 25 refs.
QE501.P53

More that 152,500 km of precision sounding lines collected mostly by Lamont Geological Observatory up to Feb. 1967 have been complemented with spaced soundings to construct a chart of the detailed submarine topography of the western South Atlantic, for the area located between 27 deg S and 57 deg S, and 28 deg W and 76 deg W. Seismic reflection data have been used to correlate the sediment distribution pattern and associated basement rock with the resulting configuration of the sea floor. On the basis of this comparative study the main physiographic provinces have been represented, defined and briefly described. Particular attention is given to the morphology of the Argentine continental margin and to its relation with other procinces. This study reveals that the Argentine Continental Slope and Rise are dissected by 70 submarine canyons, two of which, Ameghino Transverse Canyon and Almirante Brown Transverse Canyon, trend parallel to the regional isobaths. The greatest regional erosion is found on the Continental slope between 42 deg S and 46 deg S (Ameghino canyon system). The genesis of all canyons studied along the continental margin can be reasonably related to Pleistocene glacial outwash drainages. Newly identified physiographic provinces are discussed.

J-11069
Ewing, M. , Lonardi, A.G.
SEDIMENT TRANSPORT AND DISTRIBUTION IN THE ARGENTINE BASIN. 5. SEDIMENTARY STRUCTURE OF THE ARGENTINE MARGIN, BASIN, AND RELATED PROVINCES. Physics and chemistry of the Earth, 1971 Vol.8, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1429, p.123-251, 57 refs.
QE501.P53

The great sediment deposits of the Argentine Margin and Basin are described in terms of 26 newly identified reflectors, of which 2 are in the Continental Shelf, 7 in the Continental Slope, 7 in the Continental Rise, 7 in the Argentine Basin and 3 in the Malvinas (Falkland) Plateau. Horizon A, identified earlier, is

mapped unequivocally in the Argentine Basin for an area in excess of 700,000 sq mi, and, less reliably, over 76,000 sq mi at the eastern boundary and over 160,000 square miles along the Malvinas Fracture Zone and at the Malvinas Outer Basin. Horizon A extends toward the foot of the Continental Rise and apparently onlaps on reflector A* of similar seismic velocity, which is part of the Continental Rise in the northern margin. An apparently continous ridge along which the basement occasionally outcrops extends along the lower Continental Rise between the Enclosed Abyssal Plain and the foot of the Malvinas Plateau. The ridge has presumably influenced the transport of sediment to the basin since early stages of evolution of this province. Horizon B, originally considered to be a deep turbidite filling depressions in the rough basement is shown to extend over a significant portion of the Argentine Basin and onto the Malvinas outer Basin. Deformations of horizon A, lead to the conclusion that those deformations observed in the central part of the basin are older and those at the Rio Grande Rise are younger than Late Mesozoic-Early Cenozoic.

J-11070
Lonardi, A.G. , Ewing, M.
SEDIMENT TRANSPORT AND DISTRIBUTION IN THE ARGENTINE BASIN. 6. EXPLORATION AND STUDY OF THE ARGENTINE BASIN. Physics and chemistry of the Earth, 1971 Vol.8, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1430, p.253-263, 55 refs.
QE501.P53

Scientific exploration of the western South Atlantic began on Sept. 25, 1873 when the British Challenger expedition set out from Bahia Brazil, for the Tristan da Cunha group of islands. A number of soundings were made on this voyage and extensive work was done in the Argentine Basin. In 1957 a cooperative program began between Lamont Geological Observatory and the Argentine Hydrographic Service, which is still continuing, and in which Argentine and Lamont ships work jointly and/or independently on a coordinated plan aimed at a complete understanding of the South Atlantic. Marine geological, geophysical, biological and physical data have been collected by the multi-ship operation, including Lamont's Vema and Robert D. Conrad and Argentina's Sanaviron, Capitan Canepa, and Zapiola. The density of sounding lines obtained on the Argentine Continental Margin and surrounding ocean floor by Argentine and American vessels during the decade 1957-67 have contributed to a detailed understanding of the submarine morphology of these areas. In addition, the cooperative program has contributed detailed knowledge on the processes of Argentine Continental Shelf during the course of this research.

J-11086
Soveshchanie po istorii Mirovogo okeana, Moscow, 1969 , Zenkevich, L.A. ed
HISTORY OF THE WORLD OCEAN. GEOLOGICAL STRUCTURE, ORIGIN, DEVELOPMENT. Istoriia Mirovogo okeana. Geologicheskoe stroenie, proiskhozhdenie, razvitie. Moskva, Nauka, 1971, 288p., In Russian with English summary. Numerous refs., passim.
GC2.S67 1969

This book contains the proceedings of the Conference on the History of the World Ocean ogranized by the Section of Earth Sciences of the USSR Academy of Sciences jointly with the Moscow Society of Naturalists (December, 1-4, 1969) and of the Conference on Deep-sea Sediments of Oceans conducted by the Commission on Sedimentary Rocks of the Department of Geology, Geophysics and Geochemistry, USSR Academy of Sciences (December, 22-24, 1969). Geological, biological and geochemical aspects of the history of the oceans (part 1) and the deep-sea sediments of the oceans (part 2) are presented in 19 papers, of which two include data on the formation and distribution of sediments in the Antarctic region. For abstracts of pertinent papers, see:J-11087 and J-11088.

J-11087
Bezrukov, P.L. , Murdmaa, I.O.
SEDIMENTARY FORMATIONS OF THE OCEANS. Osadochnye formatsii okeanov. Soveshchanie po istorii Mirovogo okeana, Moscow, 1969. Istoriia Mirovogo okeana (Conference on the History of the World Ocean, Moscow, 1969. History of the World Ocean), Moscow, Nauka, 1971, p.107-127, In Russian with English summary. 46 refs.
GC2.S67 1969

According to tectonic features the Kainozoic sedimentary formations of the Indian and Pacific Oceans may be divided into five macro-classes: 1. Epicontinental formations (continental shelves and slopes); 2. Near-continental formations (continental rises and abyssal plains of deep-sea basins); 3. Thalassocratonic formations (basins, ridges and rises of the oceanic floor); 4. Mid-oceanic ridges system formations; 5. Geosyncline system formations (geosyncline basins of marginal seas, geoanticlines of island arcs, oceanic trenches). Each of the classes is in turn divided into several formation types. Their composition and distribution in the Pacific and Indian Oceans are described in connection with bottom tectonics and climatic zonality of sedimentation processes.

J-11088
Rateev, M.A.
RECENT VIEWS ON THE DISTRIBUTION OF CLAY MINERALS IN THE SEDIMENTS OF THE WORLD OCEAN. Sovremennye predstavleniia o zakonomernostiakh razmeshcheniia glinistykh mineralov v osadkakh Mirovogo okeana. Soveshchanie po istorii Mirovogo okeana, Moscow, 1969. Istoriia Mirovogo okeana (Conference on the History of the World Ocean, Moscow, 1969. History of the World Ocean), Moscow, Nauka, 1971, p.220-236, In Russian with English summary. 27 refs.
GC2.S67 1969

Studies on the distribution of kaoline, gibbsite, montmorillonite, chlorite, and illite in the sediments of the World Ocean, including the Antarctic regions, are reviewed. Data obtained by Soviet and American scientists are compared and charts are presented. Further investigations are suggested to continue accumulating additional knowledge of deep-sea sediments.

J-11144
Hufford, G.L. , Seabrooke, J.M.
INVESTIGATION OF THE WEDDELL SEA COASTAL CURRENT, FEBRUARY-MARCH 1970. U.S. Coast Guard. Oceanographic report, Mar. 1972 No. 51 CG 373-51, 60p., PB-209 300

A physical and chemical investigation of the Weddell Sea Coastal Current was made during the austral summer of 1970 as part of the International Weddell Sea Oceanographic Expedition. This Coastal Current has been hypothesized to be a major component in the formation of Antarctic Bottom Water. The 1970 data indicated that the Coastal Current existed from the surface to the abyssal depths in the

eastern Weddell Sea and that it decreased in temperature and increased in salinity as it flowed south over the continental shelf. This may be due to alteration of the shelf water as it flowed along and under the extensive ice shelves along the east coast or surface cooling. Nutrient concentrations below the surface layer remained relatively constant from station on the shelf. From the edge of the shelf to the depth of 2000 m Warm Deep Water was found to have the highest nutrient concentrations.

J-11149
Newell, N.D.
EVOLUTION OF REEFS. Scientific American, June 1972 226(6), p.54-65
T1.S53

The community of plants and animals that builds tropical reefs is descended from an ecosystem of two billion years ago, the changes thereof reflecting major events in the history of the earth. The principal plants of the reef community are lime-secreting algae including some whose stony growths can easily be mistaken for corals. The chief animal reef-builders today are the corals, but many other marine invertebrates are important members of the reef community. Four collapses have altered the composition of this community since the initial association between plant and animal reef-builders was established nearly 600 million years ago, the first occuring less than 70 million years after the start of the Paleozoic era, and the last, some 65 million years ago at the end of the Cretaceous. During the Cenozoic era which followed, drainage of shallow seas produced cooler climates and led to the formation of the Antarctic ice cap some 15 to 20 millions years ago. Both developments have been factors in restricting the successor reef community in diversity and distribution.

J-11165
DIVING AT THE ALMIRANTE BROWN SCIENTIFIC STATION. Buceos en la estacion cientifica Almirante Brown. Antartida, Dec, 1971 No.1, p.16-17, In Spanish.

The diving conditions, animal dangers, and equipment in the Almirante Brown Scientific Station area are briefly reviewed.

J-11215
Fedynskii, V.V. , Ushakov, S.A., Shabalin, N.A.
AGE OF THE WORLD OCEAN BOTTOM ACCORDING TO GEOPHYSICAL DATA. Vozrast dna Mirovogo okeana po geograficheskim dannym. Akademiia nauk SSSR. Doklady, June 21, 1972 204(6), p.1442-1445, In Russian. 17 refs.
AS262.S3663

On the basis of results obtained from magnetic surveys a general scheme of the age of the World Ocean bottom, including the Antarctic region, is given. The break-up of Antarctica and Australia from Africa occurred about 160 m. y. ago, possibly accompanied by the outflow of Jurassic dolerites. The significant break-up between Australia and Antarctica occurred as late as the Cenozoic era. Grooves in the Indian Ocean continue to widen at various rates such as 1 cm/yr for the West Indian ridge and 3 - 6 cm/yr for the Australo-Antarctic ridge.

J-11232
Hayes, D.E. ed
ANTARCTIC OCEANOLOGY II: THE AUSTRALIAN-NEW ZEALAND SECTOR. American Geophysical Union. Antarctic research series, 1972 Vol.19, 364p., Numerous refs.
GC461.A58

This compilation constitutes the second volume of antarctic oceanology and contains 24 papers arranged in three sections: physical oceanology, marine geophysics, and marine sediments. Each section is prefaced by an introduction which serves as a brief review, synthesizes the contributions of each section, and highlights both the important findings and the major unresolved problems within each subdiscipline. A large portion of the geologic, geophysical and oceanographic data for this sector of the ocean south of Australia and New Zealand has been collected simultaneously aboard the USNS Eltanin. The 24 papers in this volume have been abstracted separately as Nos. 11233 - 11256.

J-11233
Gordon, A.L.
INTRODUCTION: PHYSICAL OCEANOGRAPHY OF THE SOUTHEAST INDIAN OCEAN. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1771, p.3-9, 47 refs.
GC461.A58

The north-south constriction of the antarctic waters south of the Australian land mass connects the Indian and Pacific oceans. The interchange of water between these oceans contributes most of the deep and bottom water to the Pacific Ocean. This significant area is discussed in the papers in this section on physical oceanography.

J-11234
Zillman, J.W.
SOLAR RADIATION AND SEA-AIR INTERACTION SOUTH OF AUSTRALIA. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.11-40, 85 refs.
GC461.A58

Radiation measurements and bulk aerodynamic computations of the sea-air exchange of heat, water vapor, and momentum from data obtained on the USNS Eltanin cruises 35-41 provide estimates of seasonal and latitudinal variation of the surface heat budget components and wind stress for the ocean south of Australia. Zonally averaged from 115 deg to 160 deg E, annual mean sensible and evaporative heat losses by the ocean show maxima of approximately 30 w per sq m and 100 w per sq m, respectively, between 45 deg and 50 deg S, and significant seasonal variation is apparent. In the spring and summer, oceanic heat loss to the atmosphere by eddy transfer processes is small south of 55 deg S, but quite large values occur at high latitudes during autumn and winter. Global radiation measurements suggest that in the most heavily clouded zone of the Antarctic trough less than one third of the extraterrestrial radiation normally reaches the surface. The measured global radiation from the Eltanin cruises accords well with data from Macquarie I. at 54.5 deg S. The diurnal variation of the heat budget components examined at 37.5 deg S and 60 deg S is dominated by the daily insolation cycle. In the vicinity of the Antarctic trough in summer, the solar radiation, despite the heavy cloud cover, is the only ocean surface heat budget component of significance. Synoptic influences on the sea-air energy exchange are considerable.

J-11235
Denham, R.N. , Kibblewhite, A.C.
SOUND VELOCITY STRUCTURE OF THE OCEAN SOUTH OF AUSTRALIA AND NEW ZEALAND. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.41-49, 27 refs.
GC461.A58

An examination is made of the structure of sound velocity as derived from the hydrologic data obtained by the USNS Eltanin in the area south of Australia and New Zealand. Significant meridional changes in velocity structure are found to be associated with four different hydrologic boundaries that occur in the area: (1) the antarctic convergence or polar front zone, (2) the northernmost 34.2 per mille isohaline enclosing the circumpolar band of minimum salinity in the 200 m plane, (3) the Australasian subantarctic front, and (4) the southern boundary of the subtropical convergence region. South of the antarctic convergence, the velocity shows a generally monotonic increase with depth, whereas the velocity-depth profiles taken north of the boundary always show a definite Sofar velocity minimum at depths greater than 500 m. The geographical variation of Sofar axis velocity can be related to the characteristics of the general current circulation in the area.

J-11236
Eittreim, S. , Bruchhausen, P.M., Ewing, M.
VERTICAL DISTRIBUTION OF TURBIDITY IN THE SOUTH INDIAN AND SOUTH AUSTRALIAN BASINS. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1772, p.51-58, 17 refs.
GC461.A58

A region of strong light scattering exists in the bottom few hundred meters of water over the antarctic continental slope and rise. The increase in light scattering occurs at about 2500 over the rise and is apparently associated with a current of high salinity antarctic bottom water derived from the Ross Sea that flows westward along the continental margin below this depth. In the region between Australia and Antarctica, the turbidity minimum observed at intermediate depths does not appear to be associated with any particular water mass, but marks the depth of overlap between a surface biogenic nepheloid zone and the bottom nepheloid layer. The bottom layer is apparently due to the interaction of moving water with the bottom. On the north side of the South Indian basin, the bottom nepheloid layer is considerably weaker than on the south side, and this variation indicates that most of the 'load' of particles has dropped out of suspension during the passage of this water around the western side of the basin.

J-11237
Gordon, A.L. , Tchernia, P.
WATERS OF THE CONTINENTAL MARGIN OFF ADELIE COAST, ANTARCTICA. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No.1773, p.59-69, 23 refs.
GC461.A58

The topographic depressions in the Adelie shelf most likely trap dense water formed during the winter, which can be sampled during the summer. The trapped shelf water is near the freezing point of sea water; however, each pocket of shelf water has slightly different salinities. Shelf waters sampled during Eltanin cruise 37 that were the highest in salinity and greatest in density were found in the 'Adelie depression' between 142 deg and 147 deg E. Shelf water results from a mixture of the surface water and brine released during sea ice formation. For each meter of sea ice, approximately 40-50 m of shelf water is formed. The overflow of shelf water mixes with the upper parts of the slope water to form antarctic bottom water (AABW) with a potential temperature of -0.7 deg C and salinity of 34.67 per mille. On reaching the continental rise, the AABW sinking off the Adelie Coast mixes with the high salinity bottom water flowing from the Ross Sea which not only decreases the salinity of the Ross Sea water along its westward path but also increases the oxygen content of the Ross Sea bottom water by approx 0.4 ml/l.

J-11238
Gordon, A.L.
INTERACTION OF THE ANTARCTIC CIRCUMPOLAR CURRENT AND THE MACQUARIE RIDGE. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1774, p.71-78, 17 refs.
GC461.A58

South of Australia, the axis of the antarctic circumpolar current is near 50 deg S and is positioned near the mid-ocean ridge. On approaching the north-south trending Macquarie ridge, the current turns toward the south and returns abruptly to the north into the Emerald basin after passing east of the Macquarie ridge near 58 deg - 60 deg S. The total southward deflection is near 1100 km. The flow around the southern segment of the ridge, which takes the form of a large permanent loop, recombines with the transport through two deep passages in the ridge (at 53.5 deg S and 56 deg S) and continues eastward as an intense flow along the southern slope of the Campbell plateau. The southward deflection of the streamline allows relatively warm water to move far south along the crest of the Macquarie ridge. This water, exposed to the cold antarctic atmosphere, releases heat at an accelerated rate. The temperature field on a north-south plane across the warm water feature exhibits a structure similar to the double polar front found east of the Macquarie ridge. In the Macquarie area, this structure is a permanent feature, but it is transient farther to the east. Speculations have been made that warm water eddies are shed from this feature, migrate far to the east, and produce the double polar front structure.

J-11239
Boyer, D.L. , Guala, J.R.
MODEL OF THE ANTARCTIC CIRCUMPOLAR CURRENT IN THE VICINITY OF THE MACQUARIE RIDGE. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.79-93, 10 refs.
GC461.A58

Both theoretical and laboratory models of the antarctic circumpolar current in the vicinity of the Macquarie ridge are presented. The models consider a homogeneous incompressible flow but neglect wind shear stress and beta effects. The major phenomenon addressed is that of the deflection of the current due to the effects of bottom topography. The large-scale flow features indicated by the oceanographic data in this region are generally reproduced by the models. For example, for certain model parameters, large eddies are shed from the southern tip of the Macquarie ridge. The characteristics of this shedding lend support to A. L. Gordon's speculation that the double polar front zone

found east of the Macquarie ridge system is formed by the shedding of eddies from the tip of the ridge.

J-11240
Bye, J.A.T.
OCEANIC CIRCULATION SOUTH OF AUSTRALIA. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.95-100, 31 refs.
GC461.A58

New physical oceanographic observations south of Australia and north of 52 deg S are summarized and interpreted in terms of oceanic transports. The dynamic topography in the South Australian basin in 1967, 1968, 1969, and 1970 consisted of a ridge of high anomaly flanked on either side by troughs of low anomaly. The resulting anticyclonic circulation gave rise to a baroclinic transport toward the coast to the east of about 135 deg E and a transport away from the coast to the west of 135 deg E. This circulation that appears to transport about 15 x 10 exp 6 cu m/sec relative to 2000 db will be called the Flinders current. Farther to the south but north of eastward circumpolar flow, a baroclinic transport of about 30 x 10 exp 6 cu m/sec to the west occurs, except to the south of Tasmania where large variations of dynamic topography are found.

J-11241
Irish, J.D. , Snodgrass, F.E.
AUSTRALIAN-ANTARCTIC TIDES. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.101-116, 18 refs.
GC461.A58

To measure the Australian-antarctic tides, three deep-sea instrument capsules were dropped for 1 month between Australia and Antarctica along 132 deg E. Records of temperature, pressure, and current velocity were obtained. The velocity records were dominated by 3-cm/sec inertial currents, whereas tidal currents were less than 1 cm/sec. The mean flow showed great variability with changes as great as 6 cm/sec (reversing the direction of flow) over a period of 10 days. The capsule pressure records were compared with the antarctic and Australian coastal records. The observed diurnal tide can be interpreted as a Kelvin wave moving westward along the antarctic coast and a slightly smaller one traveling eastward along the south coast of Australia. Amplitude and phase vary smoothly from Australia to Antarctica. A Kelvin model does not fit the semidiurnal tide very well. The velocity is too great along the Australian coast and too small along the antarctic coast. The phase is smooth from Antarctica to the northernmost capsule and then changes abruptly at Australia, the change indicating a dissipative Australian coast with respect to the semidiurnal tide.

J-11242
Hayes, D.E.
INTRODUCTION: MARINE GEOPHYSICS OF THE SOUTHEAST INDIAN OCEAN. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1775, p.119-124, 19 refs.
GC461.A58

Three papers on morphology, magnetic anomalies, and sediment distribution constitute the geophysical reconnaissance studies of the southeast Indian Ocean. The explanation for assymmetric sea floor growth, major differential sedimentation rates, and the early rifting history of Australia, Antarctica, and New Zealand are the main unresolved problems of the area. The Pacific-Indian plate boundary south of New Zealand is examined in four papers, and the conclusions of these investigations are not in complete agreement. A study of the southwest Pacific defines many peculiar features in the tectonic and magnetic lineation pattern that may relate to similar features of the southeast Indian Ocean. The deep-sea drilling program planned for the near future should resolve many of the remaining problems in this area.

J-11243
Houtz, R.E. , Markl, R.G.
SEISMIC PROFILER DATA BETWEEN ANTARCTICA AND AUSTRALIA. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1777, p.147-164, 32 refs.
GC461.A58

Seismic profiler data from the area between Australia and Antarctica are used to compile a regional sediment isopach map and to discuss sediment distribution. Basement structure is deduced from sonobuoy data where the total sediment cover is too thick to be profiled. The Australian continental rise and South Australian abyssal plain sediments are acoustically similar to those of the antarctic continental rise and the adjacent South Indian plain. The underlying basement morphology is also similar in the two regions. These similarities suggest that similar depositional conditions have prevailed even though Antarctica has been capped by ice, probably since the Upper Miocene. The South Indian basin contains a thicker sedimentary section. Sonobuoy data from a north-south traverse at about 127 deg E and near the antarctic continental margin reveal that the basement dips steeply toward the continent and is covered by more than 4 km of sediment. In marked contrast, the margins of the Tasman and Campbell plateaus and the Pacific sector of the antarctic margin are characterized by a flat basement surface up to the foot of the continental slope. Zones of basement highs having the appearance of diapirs are observed in the South Australian abyssal plain and in the South Indian abyssal plain.

J-11244
Hayes, D.E. , Conolly, J.R.
MORPHOLOGY OF THE SOUTHEAST INDIAN OCEAN. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1776, p.125-145, 42 refs.
GC461.A58

A new bathymetric chart of the southeast Indian Ocean is presented. This portion of the Indian Ocean sea floor comprises the eastern half of the spreading Indian and antarctic plates. The bottom morphology is dominated by an east-west trending mid-ocean ridge that is symmetrically disposed between southern Australia and East Antarctica. The ridge is interrupted by a zone 250 miles wide of very rugged ridge topography herein called the Australian-antarctic discordance. The discordance has no recognizable counterpart elsewhere in the world ocean. It is characterized by north-south oriented topography lineations with relief of 200-800 fm; the lineations define a zone about 200 fm deeper than the adjacent ridge segments. Other major morphologic features include the Macquarie ridge complex, the Tasman basin, the Diamantina

fracture zone, the South Australian abyssal plain, and the South Indian abyssal plain.

J-11247
Hayes, D.E. , Talwani, M.
GEOPHYSICAL INVESTIGATION OF THE MACQUARIE RIDGE COMPLEX. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1780, p.211-234, 38 refs.
GC461.A58

A new topographic map of the Macquarie ridge and adjacent areas is presented and shows that the ridge is a highly complicated feature composed of three discrete elements. The ridge is bounded in places by pronounced topographic deeps that lie both to the east and to the west of the ridge. The free air gravity anomalies, total intensity magnetic anomalies, sediment distribution (from seismic profiler records), and seismicity associated with the area are examined in an effort to understand its evolution. The relative motion along this boundary, as predicted by sea floor spreading in the Pacific and Indian oceans, is examined in several models. It is concluded that the Macquarie ridge complex has evolved as the consequence of the interaction of the Pacific and Indian plates and that the predominant motion has been right-lateral strike slip at about 4-5 cm/yr. Discrete elements of the complex represent all three major tectonic regimes (extension, compression, and transcurrent motion), and the difficulty of categorizing the feature is the consequence of small components of extension and compression acting in conjunction with a major component of transcurrent motion.

J-11251
Conolly, J.R.
INTRODUCTION: MARINE SEDIMENTS OF THE SOUTHEAST INDIAN OCEAN. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.269-272, 9 refs.
GC461.A58

Up to 5 km of sediment has been deposited off the antarctic continent since the separation of the Australian-antarctic continents; this sediment has built up the surface of the deep South Indian plain some 1 km higher than the Australian counterpart, the South Australian plain. Pelagic sediment forms a blanket less than 100 m thick across the young mid-oceanic ridge, and Pleistocene sedimentation rates range from 0.5 to 2 cm/1000 yr. Interbedded calcareous and siliceous ooze layers, 10-50 cm thick, record striking changes in the Pleistocene planktonic record and the Tasman manganese pavement formed between Tasmania and the mid-oceanic ridge in the past 2.5 m.y.

J-11252
Watkins, N.D. , Kennett, J.P.
REGIONAL SEDIMENTARY DISCONFORMITIES AND UPPER CENOZOIC CHANGES IN BOTTOM WATER VELOCITIES BETWEEN AUSTRALASIA AND ANTARCTICA. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.273-293, 40 refs.
GC461.A58

Paleomagnetic and micropaleontologic dating of 126 sedimentary cores collected during Eltanin cruises 16, 26, 27, 34, 35, 36, and 39 south of Australia and New Zealand reveals the existence of an area of the order of 3 million sq km centered at the junction of the Southeast Indian ridge, the south Tasman basin, and the Macquarie ridge, where sediments of Brunhes to middle Gauss age (t = 0-3.0 m.y.) are largely absent. Flanking this zone toward the Australian shelf, the South Tasman rise, the northern Tasman Sea, and the antarctic continental shelf, the cores are mostly of Brunhes age (t = 0-0.69 m.y.) throughout. Despite the widespread nature of the sedimentary hiatus detected, only five cores have sediments older than 6 m.y. The preferred interpretation for these data is an increase at some time since t = 3.5 m.y. in the velocity of the antarctic bottom water from dominantly less than 10 cm/sec to dominantly more than 10 cm/sec. This increase enhances the removal of finer sedimentary fractions and the corresponding formation of residual sands, increases in micromanganese nodule concentrations, and development of manganese nodules.

J-11253
Conolly, J.R. , Payne, R.R.
SEDIMENTARY PATTERNS WITHIN A CONTINENT-MID-OCEANIC RIDGE-CONTINENT PROFILE: INDIAN OCEAN SOUTH OF AUSTRALIA. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.295-315, 55 refs.
GC461.A58

Analyses of nearly 300 piston cores from this region provide a model for sedimentation during the Brunhes within a typical continent-ocean-continent profile. Up to 20 m of graded beds were deposited during the past 700,000 years within the South Australian and South Indian abyssal plains but as little as 1 m of ooze was deposited in some regions on the crest of the ridge during the same period. Generally, the mid-oceanic ridge is covered by 3-6 m of Brunhes calcareous ooze on the northern ridge flank, siliceous ooze on the southern ridge flank, and a mixture in a 600 km wide zone across the center of the ridge. Sedimentation patterns in these areas were similar during the Matuyama magnetic epoch. The interbedding of calcareous ooze with siliceous ooze throughout the past 2 m.y. is thought to be caused by fluctuations in antarctic climate. Six warm and six cold cycles are recognized for the Brunhes magnetic epoch. On the deep ridge flanks at depths greater than about 4500 m, manganese nodules commonly cover the sea floor. In the Tasman fracture zone and southern Tasman basin, the sea floor is covered with a manganese nodule and sandy pavement that overlies compact gray siliceous ooze of early Gauss or Gilbert age.

J-11254
Scott, M.R. , Osmond, J.K., Cochran, J.K.
SEDIMENTATION RATES AND SEDIMENT CHEMISTRY IN THE SOUTH INDIAN BASIN. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.317-334, 46 refs.
GC461.A58

Sedimentation rates and sediment chemistry have been studied on a series of piston cores and trigger cores from the South Indian basin and the Southeast Indian ridge. Sedimentation rates were measured by alpha and gamma spectrometry of Th-230 excess in the sediment; general agreement was observed between the two methods, and these data are generally consistent with the rates determined from paleomagnetic reversal data. Continental slope and rise sediments are accumulating at 0.7-1.6 cm/1,000 yr. The sedimentation rates generally decrease northward across the South Indian basin but are locally high in biogenic oozes on and near the ridge; biogenic sediment accumulation rates are commonly 1-2 cm/1,000 yr. The accumulation rates of clay and the metals Fe, Al, Mn, and U, and correlations between sediment contents are

discussed.

J-11255
Glass, B.P.
AUSTRALASIAN MICROTEKTITES IN DEEP-SEA SEDIMENTS. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.335-348, 42 refs.
GC461.A58

Coincident with the reversal of the magnetic field of the earth 0.7 m.y. ago, approximately 10 exp 14 g of microscopic glassy particles were deposited on the ocean floor south of Australia and over much of the rest of the Indian Ocean. These glassy particles, called microtektites, represent a portion of the Australian tektite-strewn field as indicated by their appearance, geographical occurrence, age of deposition, age of formation (fission track age), petrography, physical properties, and chemical compositions. Present theories of tektite origin suggest that tektites were formed by impact and thus deposited over the entire strewn field instantaneously (geologically speaking). Thus the Australian microtektite layer provides a chronostratigraphic horizon throughout much of the Indian Ocean including the area south of Australia. The microtektite horizon appears to be coincident with several paleontologic boundaries. The amount of sediment reworking that has taken place since the microtektites fell is indicated by the vertical dispersion of the microtektites in the cores between 35 and 90 cm.

J-11256
Payne, R.R. , Conolly, J.R.
TURBIDITE SEDIMENTATION OFF THE ANTARCTIC CONTINENT. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.349-364, 29 refs.
GC461.A58

The ocean floor off the antarctic continent south of Australia is characterized by a deep (300-500 m) continental shelf covered with glacial marine sediment, a canyon-incised continental slope covered by gray muds and sands, and an extensive fan valley abyssal plain complex covering an area of 1000 by 1900 km (the South Indian plain). This abyssal plain is covered by terrigenous sediment up to 5 km thick along the continental margin; this sediment thins to sediment ponds (200-500 m thick) filled with interbedded terrigenous clays and pelagic ooze along the southern flanks of the mid-oceanic ridge. Analyses of 34 piston cores taken from the USNS Eltanin in the continental margin-abyssal plain-distal pond region indicate that Pleistocene sedimentation is dominated by three major processes. These are described. The analysis of closely spaced piston cores in the deep central part of the South Indian plain allows the correlation of turbidite and pelagic ooze sequences 1-3 m thick over distances of more than 50 km. Sedimentation rates in this distal area of the South Indian plain are 1 cm/1000 yr for pelagic ooze and 5 cm/1000 yr overall.

J-11265
Joint Oceanographic Assembly, IAPSO, IABO, CMG, SCOR, September 13-25, 1970, Tokyo, Japan , Uda, M. ed
OCEAN WORLD; PROCEEDINGS OF THE ASSEMBLY. Tokyo, Japan Society for the Promotion of Science, Dec. 1971, 562p.

The Proceedings contains abstracts of approximately 300 invited papers and papers presented during the Assembly, as well as a summary of each symposium and session, written by its convener or organizer; brief reports of business meetings; the program of daily events; and speeches made by the representatives at the opening or closing ceremonies. Twenty-three of the papers summarized pertain to Antarctic waters and appear in the following sections: Some aspects of Antarctic ice and water masses; The benthic boundary; Distribution of chemical species; Global tectonics and sea-floor spreading; Contributions in physical oceanography; and Contributions in biological oceanography. The Assembly was a joint venture of the International Association for the Physical Sciences of the Ocean (IAPSO), the International Association of Biological Oceanography (IABO), the Commission on Marine Geology (CMG), and the Scientific Committee on Oceanic Research (SCOR). It has been proposed that the next Joint Oceanography Assembly be held in 1976.

J-11270
Anderson, J.B.
MARINE GEOLOGY OF THE WEDDELL SEA. Florida. State University, Tallahassee. Sedimentological Research Laboratory. Contribution, Aug. 1972 No.35, 222p., Doctoral thesis. Numerous refs.

Piston and Phleger cores collected in the Weddell Sea during the 1963-64 Eltanin cruises 7 and 12 and 1968-70 international Weddell Sea Oceanographic Expeditions were studied. At present both wet-base (melting) ice shelves and dry-base (freezing) ice shelves exist in the Weddell Sea. Modern faunal and sedimentary facies are used to construct a model for the recognition of ancient glacial-marine deposits which is applied to those ancient sediments of the Weddell Sea. The oldest sediments taken from the Weddell Sea are believed to date back 5.7 m.y. and indicate dry-base conditions during that time. Continental shelf and slope deposits indicate that the Brunt and Filchner Ice Shelves receded to their present positions within the last 5,000 yr. while the Ronne and possibly the Larsen ice shelves appear to be presently advancing.

J-11271
Foster, T.D.
ANALYSIS OF THE CABBELING INSTABILITY IN SEA WATER. Journal of physical oceanography, July 1972 2(3), p.294-301, 22 refs.

Due to the nonlinear equation of state of sea water it is possible for the mixture of two parcels of sea water with the same density but different temperatures and salinities to have a density greater than that of the constituent parcels. This phenomenon is sometimes called cabbeling. In the deep parts of the Weddell Sea the surface water is usually colder and less saline than the underlying deep water. In winter the salinity of the surface water can increase due to sea ice formation, and then mixtures of surface water and deep water may become denser than the underlying deep water. An instability can develop which may transport the heavier mixed water through the deep water and contribute to the formation of Antarctic Bottom Water. A time-dependent, finite-amplitude, theoretical analysis of this instability has been made. Assuming turbulent mixing, expressions for the preferred horizontal spacing and velocities of the resulting convection currents have been derived for conditions that may be typical of the Weddell Sea. It is concluded that the cabbeling instability may be important to the formation of Antarctic Bottom Water.

J-11273
Payne, R.R. , Concilly, J.R., Abbott, W.H.
TURBIDITE MUDS WITHIN DIATOM OOZE OFF ANTARCTICA: PLEISTOCENE SEDIMENT VARIATION DEFINED BY CLOSELY SPACED PISTON CORES. Geological Society of America. Bulletin, Feb. 1972 83(2), p.482-486, 11 refs.
QE1.G2

To test the ability to correlate sediments in deep ocean basins, 5 piston cores were taken from one station on Eltanin cruise 44, in one of the deepest and flattest regions of the Wilkes Abyssal Plain off East Antarctica. The 5 cores are characterized by interbedded siliceous ooze and terrigenous turbidite mud beds. The siliceous ooze is characterized by burrow mottling and high diatom and radiolarian content. The terrigenous mud beds have sharp basal contacts, lack evidence of burrowing except in the upper 10 to 20 cm, and are 20 cm to 2.5 m thick. Detailed examination of each core using smear slides at 10 cm intervals and examination of the diatom assemblages show that several major zones in the cores can be correlated with confidence. Correlations from one core to another were made using the relative stratigraphic position and sequence of pelagic and turbidite zones, and also by using three major diatom assemblage zones: the Nitzchia kerguelensis zone, the Rouxia sp. zone and the Actinocyclus ingens zone. Not only could major pelagic ooze and turbidite zones in the five cores be correlated over the short distance at the drift station, but they could also be correlated with zones found in a sixth core taken 55 km away. Rates of sedimentation for the pelagic zones are 1 cm per 1,000 yrs. and total sedimentation rates are 5 cm per 1,000 yrs.

J-11288
Treshnikov, A.F. , Shamont'ev, V.A., Grigor'ev, IU.A., Belinskaia, L.A.
SEASONAL AND LONG-PERIOD VARIATIONS IN THE HYDROLOGICAL COMPONENTS ALONG THE 20 DEG E PROFILE. Sezonnaia i mnogoletniaia izmenchivost' gidrologicheskich elementov na razreze po 20 grad.V.D.. Problemy Arktiki i Antarktiki; Sbornik statei, 1972 Vol.39, p.11-24, In Russian. 18 refs.
G575.L422

Data collected in sub-Antarctic and Antarctic waters along the 20 deg E profile (between Africa and Antarctica) from 1935 to 1969 are tabulated and graphed showing seasonal and annual variations in water temperature, salinity and current velocity from the 0 to 200, 200 to 500, and 500 to 1000-m water layers, and the discharge of water, heat and salts from the 0 to 1000-m layer. The studies show that atmospheric circulation affects the hydrological variations most, and the greatest variations appear in the northern part of the profile. The predominant factor affecting variations in temperature and salinity in the north is water current. The more noticeable seasonal temperature variations occur in the upper 200-m water layer S of 45S, and are due to irregular amounts of solar radiation received by the water during the year.

J-11311
Lisitsyn, A.P.
RATE OF RECENT SEDIMENTATION IN THE OCEANS.. Oceanology, 1971 11(6), p.790-802, Translated from Okeanologiia, 11(6): 957-968, 1971. 49 refs.
GC1.03913

The first map of sedimentation rates for the Pacific, Atlantic and Indian Oceans, including their southern parts, was drawn using a series of new techniques and principles. One of the principal methods used was analysis of the quantitative distribution of suspension in the water and comparison of the suspension with bottom sediments. Age was determined mainly by the ionium-protactinium and ionium techniques and also by numerous paleomagnetic observations, foraminifera and diatom analysis, and by C14 dating. Over 700 reliable determinations and 600 approximate ones were used to compile the map. In all the oceans, the slowest sedimentation rate coincided with the arid (halistatic) zones: less than 1.0 mm and 1.0-3.0 mm/1,000 yr. The regions of highest rates form three latitudinal belts. The middle one coincides with the equatorial zone; the other two, with the northern and southern humid zones. The climatic zonality of the inflow of biogenic and terrigenous material is quite distinct. The zonal distribution of the rates corresponds to that of the amount of suspended material in the water column. Another pattern inferred from the map is the effect of vertical zonality, particularly strong in regions of carbonate accumulation. At depths greater than critical, the sedimentation rate is 1/10 or less of that in the regions of carbonate sediments. The third general pattern is the dependence of sedimentation rates on circumcontinental zonality. The sedimentation rate increases everywhere with proximity to land. Lithological and geochemical methods can also be used to determine the displacement of the boundaries of icebergs and of diatomaceous and foraminiferal sediments in Antarctica during the earlier periods of cooling and warming.

J-11312
Bolgurtsev, B.N.
WATER CIRCULATION IN THE SOUTH PACIFIC OCEAN. Oceanology, 1971 11(6), p.832-838, Translated from Okeanologiia, 11(6):1008-1015, 1971. 28 refs.
GC1.03913

The results of calculations of surface and deep-water currents in the South Pacific Ocean are reported. They were based on A. S. Sarkisyan's theoretical model, which allows for the influence of bottom topography, an arbitrary shoreline configuration, and the liquid flow rate through the open part of the basin. The results are compared with a previous numerical solution. The influence of seasonal variations of atmospheric pressure and water density on the currents is discussed. The characteristic features of the meridional and vertical water circulation in the Pacific sector of Antarctica are described. It is observed that the geometry of horizontal flows depends strongly on bottom relief. Charts showing the level surface and the horizontal and vertical velocities are included.

J-11345
Omoto, K.
PRELIMINARY REPORT ON MODERN CARBON DATINGS AT SYOWA STATION AND ITS NEIGHBOURHOOD, EAST ANTARCTICA. Antarctic record, March 1972 No.43, p.20-24, 5 refs.

This report presents modern carbon data on sea water, lake water, and atmospheric carbon dioxide at Showa Station and area. The results indicate that only sea water samples were not of modern carbon age. The existing data on carbon dates in Antarctica require revision, based on the carbon ages of modern samples. After these corrections it will be possible for geomorphologists, geologists, and glaciologists to discuss precise chronology, isostatic uplift, and eustatic sea-level changes in Antarctica. The modern age of lake water samples proves that the lake water has been fed by melting of

snowfalls after the retreat of the continental ice tongues in Skallen. The results on atmospheric carbon dioxide can be attributed to global circulation. Radiocarbon data on modern carbon samples in Antarctica may differ regionally.

J-11367
Geosecs Scientific Advisory Council
GEOCHEMICAL OCEAN SECTIONS PROGRAM (GEOSECS). COLLECTED PAPERS: 1970-1971. Earth and planetary science letters, Sept. 1972 16(1), p.45-145. Numerous refs.
QE1.E12

A collection of fifteen papers are presented which describe the results obtained by the International Decade of Ocean Exploration Gecsecs program since the Geosecs I study in the North Pacific. The first five of the papers deal with some of the initial results from Leg 15 of SIO (Scripps Institution of Oceanography) Antipode Expedition, with the current status of the measurement of barium -- an element of great importance because of its relationship to radium and silicon -- and with recent developments in the extraction of Si-32 and Ra-228 on synthetic fibers. The remaining papers describe the work done at the North Atlantic station, Geosecs II, on the ship R/V Knorr. For papers abstracted separately see 11368 to 11371.

J-11368
Craig, H.
GEOSECS PROGRAM: 1970-1971. Earth and planetary science letters, Sept. 1972 16(1), p.47-49, 6 refs.
QE1.E12

Geosecs is an acronym for Geochemical Ocean Sections, a cooperative program for the application of geochemical and hydrographic measurements to the study of circulation and mixing processes in the world oceans. The Geosecs program is part of the International Decade of Ocean Exploration and will include deep-sea expeditions by the United States, France, West Germany, and Japan, and participation of shore-based laboratories in these ccuntries and in Canada, India, and Italy. Funding of the U.S. program (through the National Science Foundation) began in 1971. Since the inception of the program, five intercalibration and testing stations or expeditions have been mounted, in which detailed vertical profiles have been obtained: Geosecs-II in the North Atlantic, Aug., 1970; Leg 15 of SIO (Scripps Institution of Oceanography) Antipode Expedition in the South Pacific in Aug. 1971, and the Gogo I and II reoccupations of Geosecs I in Nov. 1971, and Apr. 1972. Approximate expedition tracks in the Atlantic and Pacific Oceans are shown, including the Norwegian Sea-Scotia Sea and Antarctic Punta Arenas-Cape Town routes to be followed by the U.S. ship R/VKnorr.

J-11369
Craig, H. , Chung, Y., Fiadeiro, M.
BENTHIC FRONT IN THE SOUTH PACIFIC. Earth and planetary science letters, Sept. 1972 16(1), p.50-65, 29 refs.
Qe1.E12

The "benthic front" an abyssal discontinuity surface between deep and bottom water, occurs over an area of some 10,000,000 sq km in the interior South Pacific. The front is triangular in shape and appears to be positioned by the effect of bottom topography on the flow of bottom water. Leg 15 of SIO Antipode Expedition (1971) was a Geosecs preparation and intercalibration study, in which the scientific objective was a detailed study of the "benthic thermocline" and its relation to the oxygen, nutrient, and salinity extremes in the western boundary region between Samoa and Tonga. In this paper, a preliminary summary of the Atipode results and an interpretation of these and other recent expedition data are presented in order to provide a framework for discussion of the Pacific Geosecs program. It is noted that the Japanese Southern Cross Expedition obtained beautiful meriodional sections from 30 deg N to 70 deg S, along 170 deg W, of oxygen, phosphate, nitrate, and silicate.

J-11370
Bacon, M.P. , Edmond, J.M.
BARIUM AT GEOSECS III IN THE SOUTHWEST PACIFIC. Earth and planetary science letters, Sept. 1972 16(1), p.66-74, 20 refs.
QE1.E12

A detailed, highly precise barium profile has been measured at Geosecs III, off Tonga, in the southwest Pacific. There is a smooth increase from the surface values of 4.7 microg/kg to a deep maximum of 18.4 microg/kg at 2.974 km. Below this maximum there is an abrupt decrease to 14.3 microg/kg in the deep Western Boundary Current. Comparison with published data shows recent Pacific and Antarctic barium profiles to be consistent within 2 per cent. Model calculations do not require any in situ injection of barium (or of silicate or alkalinity) in the water column; the form of the profile can be explained by vertical diffusion and advection between horizontally advecting water masses. It appears that a minor core of higher salinity water, possibly derived from Ross Sea bottom water, or the North Atlantic deep water core in the Circumpolar Current, is present immediately above the deep Boundary Current. (Auth.)

J-11371
Spencer, D.W.
GEOSECS II, THE 1970 NORTH ATLANTIC STATION: HYDROGRAPHIC FEATURES, OXYGEN, AND NUTRIENTS. Earth and planetary science letters, Sept. 1972 16(1), p.91-102, 13 refs.
QE1.E12

Profiles of salinity, temperature, oxygen and nutrients for a station at 35 deg 46.5'N and 67 deg 59.8'W show the influence of the five major sources of deep water in the North Atlantic Ocean: Antarctic Bottom Water, Denmark Strait overflow, Iceland-Scotland overflow, Labrador Sea water, and Mediterranean water. The presence of distinct, indentifiable cores of water types, far removed from their sources, together with linear relationships between salinity and both oxygen and silicate in the deep water suggest that horizontal mixing processes predominate over vertical dissipation and in situ production or loss processes in determining the distribution of these tracers in the deep western Atlantic Ocean. It is not unlikely that the influence of the Antarctic Bottom Water occurs at about 4950 m.

J-11390
Jacobs, S.S. , Amos, A.F.
PHYSICAL AND CHEMICAL OCEANOGRAPHIC OBSERVATIONS IN THE SOUTHERN OCEAN. USS ELTANIN CRUISES 22-27, 1966-1967. Columbia University. Lamont Geological Observatory. Technical report, Nov. 1967 No. 1-CU-1-67, 289p., 29 refs.

This report includes serial hydrographic data, continuously recorded in-situ Salinity/Temperature/Depth (STD) measurements.

and chemical observations taken on Eltanin Cruises 22-27, Jan. 1966, through Feb. 1967. A station map and track chart are included. Data from Eltanin Cruises 4 through 21 have appeared in earlier reports along with analyses and discussions of the methods of data collection and reduction. Except for the STD/SAMS system, the methods of data collection and processing remained essentially as described in previous reports. Bathythermograph casts (1568) were made during the six cruises. Digitized records and analog prints of the BT slides will be on file at the Lamont Geological Observatory and at the National Oceanographic Data Center. Continuous surface-temperature records were obtained with a towed thermistor and are on file at Lamont.

J-11411
Devine, M.
SOME ASPECTS OF THE DYNAMICS OF THE ANTARCTIC CIRCUMPOLAR CURRENT. Journal of geophysical research, Oct. 20, 1972 77(30), p.5987-5992, 12 refs.
QC811.J6

Equations of the type used to study the oceanic thermocline are used to construct a friction-less geostrophic model of the Antarctic Circumpolar Current (ACC). The Drake Passage region is modeled as a continuous porous barrier, as was done by Stommel (1962) for a barotropic model of the ACC. The results indicate large eastward-directed barotropic and baroclinic flows, and large-scale exchanges of water between the ACC and subtropical gyres to the north. The baroclinicity of the ACC is shown to be essential to all aspects of the flow. (Auth.)

J-11412
Gordon, A.L. , Bye, J.A.T.
SURFACE DYNAMIC TOPOGRAPHY OF ANTARCTIC WATERS. Journal of geophysical research, Oct. 20, 1972 77(30), Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1864, p.5993-5999, 21 refs.
QC811.J6

The sea surface dynamic-height anomaly relative to the 2500-db level for the antarctic waters displays new details of the Antarctic Circumpolar Current. The width and intensity of the current vary greatly; constrictions occur south of the Campbell plateau at the Drake Passage (near 145 deg W), although the flow is relatively diffuse over the Southeast and Southwest Pacific basins. The variation of sea surface slope across the Drake Passage is nearly the same as that observed in the tidal records at the opposing coast lines. To the lee of the Campbell plateau and 145 deg W are wavelike structures in the dynamic topography suggestive of Rossby waves. (Auth.)

J-11413
Schlatter, T.W.
LOCAL SURFACE ENERGY BALANCE AND SUBSURFACE TEMPERATURE REGIME IN ANTARCTICA. Journal of applied meteorology. Oct. 1972 11(7), p.1048-1062, 42 refs.
QC851.A66

The physical processes occuring within a perennial snow cover and at its surface are discussed with particular emphasis on monthly variations in Antarctic snow. Results of a one-year simulation of physical processes in snow are compared with 1958 data at Mirnyy and Pionerskaya, Antarctica. The simulation demonstrates the following: first, solar radiation is effective to a depth of 50 cm or so, but longwave radiation cools the surface alone, causing the "greenhouse" effect first observed in snow at least four decades ago. Highest summertime temperature and initial snowmelt thus occur not at the surface but roughly 10 cm below it. Second, the percolation of meltwater with eventual refreezing during the subsequent winter is the most efficient mechanism for modifying the temperature profile at depths of several meters or more. Third, concerning the surface energy budget, at temperatures below -20C, atmospheric sensible heat flux approximately compensates net radiation throughout the year. When the temperature nears 0C (only in summer), the surplus of net radiation is used primarily for changes of phase-sublimation and possibly melting; little energy is used to heat the snow. Then latent heat flux approximately compensates net radiation.

J-11462
ANTARCTIC OCEANOGRAPHIC EXPEDITIONS. Campañas oceanograficas Antárticas. Buenos Aires, Talleres Graficos del S.H.N., 1971, 468p., In Spanish. 13 refs.

Oceanographic data on the Weddell Sea collected during studies from 1964 to 1969 are given in temperature-salinity diagrams, tabular summaries of chemical data, profiles and charts of temperature and salinity, and brief text on Weddell Sea water masses and phytoplankton. Maps showing the positions of stations are included.

J-11485
Marshallsay, P.G. , Radok, R.
DRIFT CARDS IN THE SOUTHERN AND ADJACENT OCEANS. Horace Lamb Centre for Oceanographical Research. Research paper, May 1972 No.52, Bedford Park, The Flinders University of South Australia, 15 + p., 3 refs.

Plastic drift cards were released into the ocean south of Australia. Between Dec. 1969 and March 1972, 16,000 cards were released, of which 2,137 have been found, as far away as South Africa and Chile. Factors affecting distribution and discovery of cards (currents, tides, population density, geography, etc.) are analyzed. Results are interpreted according to area of card discovery.

J-11491
Capurro, L.R.A. , Lanfredi, N.W.
SURFACE AND DEEP CURRENT MEASUREMENTS IN THE SOUTHWESTERN ATLANTIC. Medición de corrientes superficiales y profundas en el Atlantico sudoccidental. Buenos Aires, Talleres Graficos del S.H.N., 1970, 46p., In Spanish with English abstract and partial translation of text into English. Numerous refs.

From 1966 to 1968 Argentine and American scientists conducted a program of field of motion measurement and water masses study in the southwestern Atlantic. The purposes of the study were to obtain data on the field of motion in a broad continental margin and to determine the validity of the geostrophic approximation in velocity determinations. This report explains how the field operations of the several cruises in the program were planned and executed.

J-11492
Belliard, M.
ON THE OCEANOGRAPHIC VESSEL U.S.N.S. ELTANIN. A bord du navire océanographique U.S.N.S. "Eltanin". Paris, La Documentation Française,

1969, 34p., In French.

The January 10 - March 3, 1969 mission of the Eltanin in the Antarctic Ocean is reviewed. Three major research areas were (1) characteristics, formation, and circulation of water in the marginal zone of Antarctica near Balleny Islands, (2) the Antarctic convergence, (3) bathymetric and hydrological data on depressions near Macquarie Island and the fault zone between roughly 120E and 123E. Research details, mission organization, and a discussion of the Eltanin's equipment (with numerous photographs) are included.

J-11496
Heath, R.A.
CIRCULATION AND HYDROLOGY UNDER THE SEASONAL ICE IN MCMURDO SOUND, ANTARCTICA. New Zealand journal of marine and freshwater research, Dec. 1971 5(3/4), p.497-515, 7 refs.

Results are presented of measurements of current velocity, temperature and salinity made at seven positions in McMurdo Sound: four near the seasonal ice/fast ice boundary, two along the seasonal ice/sea boundary, and one in a channel in the sea ice. Current velocities were strongly influenced by tides with speeds greatest during periods of high tidal range. Current velocities changed rapidly in the upper 100 m and current speeds generally increased with depth to within 200 m of the bottom. The mean circulation near the seasonal ice/fast ice boundary, found by eliminating the tidal variation, appears to consist of an inflow of water towards the fast ice at positions further than a mile (1.3 km) from Ross I. and a net outflow from under the fast ice at positions closer than a mile (1.3 km) from Ross. I. (Auth.)

J-11506
Grigor'ev, IU.A.
HYDROLOGICAL INVESTIGATIONS IN PRYDZ BAY. Gidrologicheskie issledovaniia v zalive Priuds. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.180-199, In Russian. 10 refs.
G860.S63

Hydrological studies were carried out during the 12th voyage of the Ob' in Prydz Bay from 14 to 21 Feb. 1967 at 33 stations located 30-40 mi apart. The data were compared to those obtained during the last 20 years. The greatest seasonal water-temperature variations, reaching more than 3 degrees, occur in the western part of the bay, while in the eastern part they are less than 1.5 degrees. Sea surface temperature in the summer varies from -1.5 to 1 C and salinity from 32.74 ro 34.25 per mille. Vertical distribution of temperature, salinity and oxygen content are tabulated and discussed. Clockwise circulation predominates, with two centers, in the central and southwestern parts of the bay. The velocity of water circulation reaches 7.5 cm/sec in the southern and 9.2 cm/sec in the western parts. Counterclockwise circulation of about 2.5 cm/sec was observed in the eastern part of the bay.

J-11507
Znachko-IAvorskii, G.A.
MARINE GEOLOGICAL STUDIES. Morskie geologicheskie raboty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.200-208, In Russian.
G860.S63

The distribution of sedimentary material was studies aboard the Ob' at 40 stations (25 stations in Prydz Bay, 9 along an Australia-Mirnyy profile, and 6 between Antarctica and South Africa). Preliminary results show clear zonality in the distribution of various genetic types of the bottom sediments.

J-11524
Lisitsyn, A.P. , Lin'kova, T.I.
PALEOMAGNETIC AND LITHOLOGICAL INVESTIGATIONS OF SEDIMENTS FROM THE SEA FLOOR OF THE SOUTHERN INDIAN OCEAN. Paleomagnitnye i litologicheskie issledovaniia donnykh osadkov iuzhnoi chasti Indiiskogo okeana. Akademiia nauk SSSR. Izvestiia. Seriia geologicheskaia, Jan. 1972 No.1, p.129-134, In Russian. 5 refs.

Paleomagnetic and chemical examinations were made of 6 deep-sea sedimentary cores collected by the ist, 2nd, and 3rd Soviet Antarctic Expeditions in the southern Indian Ocean. Data on paleomagnetic polarity changes, granulometry, and chemical and mineralogical content of the cores are graphed and discussed. It was concluded that all lithological types of deep-sea sediments are characterized by high stability remanent magnetism and can be used for paleomagnetic investigations. The occurrence of a zone of reversal in polarity cannot be explained by the component changes in ferromagnetic fraction or chemical changes found in the cores.

J-11525
Petrushevskaia, M.G. , Lin'kova, T.I.
RELATIONSHIP BETWEEN THE RADIOLARIAN AND PALEOMAGNETIC ZONES IN SEDIMENTS OF THE INDIAN OCEAN. K voprosu o sviazi radioliarievykh i paleomagnitnykh zon v donnykh osadkakh Indiiskogo okeana. Akademiia nauk SSSR. Izvestiia. Seriia geologicheskaia, June 1972 No.6, p.18-23, In Russian. 14 refs.

A study of distribution reveals normal polarity and almost exclusively recent Quaternary Radiolaria in the upper part of 4 deep-sea sediment cores from the southern Indian Ocean. Magnetic reversals were found at a depth of from 2.3 to 3.2 m of the core, which is the Brunhes-Matuyama polarity boundary. According to the data from Hays and Opdyke (L-5789) and Opdyke et al (L-4579), the polarity boundary correlates with the faunal boundary, which is marked by disappearances of Radiolaria Pterocanium trilobum and Saturnalis circularis. The two species became extinct at high latitudes after, the changes in polarity occurred. It is assumed that these species disappeared not in a short period of time (between 0.7 and 0.6 m.y. ago), and the areas inhabited by them reduced very slowly.

J-11526
Bezrukov, P.L. , Andrushchenko, P.F.
FERRO-MANGANESE NODULES FROM THE INDIAN OCEAN. Zhelezo-margantsevye konkretsii Indiiskogo okeana. Akademiia nauk SSSR. Izvestiia. Seriia geologicheskaia, July 1972 No.7, p.3-20, In Russian. 29 refs.

Data on the distribution of ferro-manganese nodules obtained from 39 stations by the Vityaz' in the Indian Ocean show that the highest concentrations of the nodules occur at the bottom of hollows with a disjointed relief and low-rate sedimentation, and at the foot of large submarine ridges. Mineral and chemical content and structure of the nodules and ore incrustations are given. It is determined that the primary ore-forming minerals are vernadite and psilomelane, and the secondary are todorkite and bernessite. Data on typical textures of ferro-manganese nodules, indicating that various

processes were involved in their formation, are discussed.

J-11533
Emel'ianov, E.M. , Lisitsyn, A.P., Koshelev, B.A.
DISTRIBUTION AND COMPOSITION OF CARBONATES IN THE UPPER LAYER OF BOTTOM SEDIMENTS OF THE ATLANTIC OCEAN. Akademiia nauk SSSR. Doklady. Earth science sections, Jan. 1972 196(1-6), p.236-238, Translation from Akademiia nauk SSSR. Doklady, 196 (1):207-209, Jan.- Feb. 1971. 7 refs.

The carbonate distribution in the upper layer of sediments in the Atlantic Ocean, including the southern part, was studied at 2500 stations. The distribution and content of the biogenic and mineral carbonates, as related to climatic, circumcontinental, and vertical zones, are discussed. Biogenic carbonates are widely distributed in the sediments and are represented by three mineral species: calcite, magnesiocalcite and aragonite. For Russian original see J-9114.

J-11553
Gordon, A.L.
SPREADING OF ANTARCTIC BOTTOM WATERS II. Studies in physical oceanography; a tribute to Georg Wust on his 80th birthday, Vol. 2, edited by A. L. Gordon, New York, Gordon and Breach, 1972, p.1-17, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1596. 25 refs.
GC21.S83

The general spreading of bottom water by advective and diffusive transports is determined from distribution of bottom potential temperature, salinity and oxygen. The area south of 40S between 130W westward to 110E is studied mainly with USNS Eltanin Cruises 27, 32-37, 39, 41, 42 and 43 data. The bottom water is composed of a mixture of three basic water types: lower Circumpolar Deep Water, water type B which is a cold relatively fresh (34.66 per mille) variety of Antarctic Bottom Water and water type C, a cold, but high salinity (34.75 per mille) variety of Antarctic Bottom Water. Type C is believed to be derived from the Ross Sea Shelf Water. It is found in the eastern and southern South Indian Basin, an area just northwest of the Ross Sea and in the southwestern corner of the Southeastern Pacific Basin. Water type B is more common. It is similar to the Bottom water observed leaving the Weddell Sea; however, other sources are suspected. The bottom water spreading is basically clockwise in the basins between Antarctica and the mid-ocean ridge and from west to east in the basins to the north of the mid-ocean ridge. A flow from the South Indian Basin to the southern part of the Tasman Basin occurs near 145 deg to 155 deg E. This water eventually crosses the Macquarie Ridge to enter the Southwest Pacific Basin. (Auth.)

J-11554
Eittreim, S. , Gordon, A.L., Ewing, M., Thorndike, E.M., Bruchhausen, P.
NEPHELOID LAYER AND OBSERVED BOTTOM CURRENTS IN THE INDIAN-PACIFIC ANTARCTIC SEA. Studies in physical oceanography; a tribute to Georg Wust on his 80th birthday, Vol. 2, edited by A. L. Gordon, New York, Gordon and Breach, 1972, p.19-35, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1601. 19 refs.
GC21.S83

A nepheloid layer of roughly 1 km thickness is associated with the bottom waters of the basins south of the mid-ocean ridge in the Indian-Pacific region between 120 deg E and 120 deg W. A downward increase in light scattering intensity of about a factor of six occurs in this layer. The mid-ocean ridge is breached by the turbid, cold bottom water only at its intersection with the Macquarie Ridge. The water which produces the highest light scattering intensities is Antarctic Bottom Water (AABW) with high oxygen content and it occurs close to the Antarctic continent in the South Indian Basin. Apparently the nepheloid layer is fed by particles suspended in the dense shelf water as it sinks to form new AABW. Turbulence in the AABW then maintains the particles in suspension as the water mass circulates around and through the deep basins. This turbulence accompanies the irregular bottom currents which often reach velocities of over 15 cm/sec. The short duration current measurements reported here show a dominance of irregular motion, with a mean flow clockwise in the South Indian Basin. The depression of the top of the nepheloid layer in the center of this basin is a reflection of this clockwise flow of nepheloid AABW. (Auth.)

J-11555
Eittreim, S. , Ewing, M.
SUSPENDED PARTICULATE MATTER IN THE DEEP WATERS OF THE NORTH AMERICAN BASIN. Studies in physical oceanography; a tribute to Georg Wüst on his 80th birthday, Vol. 2, edited by A. L. Gordon, New York, Gordon and Breach, 1972, p.123-167, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1602. 66 refs.
GC21.S83

The North American Basin nepheloid layer is a permanent feature of the bottom waters covering the continental rise, abyssal plains and Bermuda Rise. On the average, a ten-fold increase in light scattering occurs from the clear water at mid-depths to the maximum intensity scattering near the bottom in the nepheloid layer. On the basis of (a) the general conformity of the "top" of the nepheloid layer to the deep water isotherms and (b) the occurrence of the nepheloid layer in regions where bottom currents are strongest, it is concluded that the nepheloid layer is related to the major bottom currents of the North American Basin, the Western Boundary Undercurrent and the Antarctic Bottom Current, the former being identified with the highest scattering intensities. Particulate matter recovered in water samples in the nepheloid layer shows the layer to be composed of clay and silt sized mineral matter, organic debris and silicate and carbonate tests, in generally that order of abundance. The highest concentrations recovered were in regions of the most intense light scattering and were slightly higher than 0.1 ppm. Average particle size, including aggregates, for the nepheloid layer is 12 microns by volume. Turbulence associated with the WBU and AABC combined with an influx of sediments from the adjacent continent is responsible for the nepheloid layer.

J-11603
Reid, J.L. , Moynihan, M.J., Anderson, G.C.
ANTARCTIC RESEARCH ABOARD NORTHWIND IN FEBRUARY 1972. Antarctic journal of the United States, July-Aug. 1972 7(4), p.123-125, 7 refs.
G845.A56

Oceanographic investigations were carried out aboard the Northwind in the SE Pacific Basin with maximum depth over 4,000 m between 68 and 76 S and between 152 and 171 W in Feb. 1972. Temperature, salinity, oxygen, phosphate, nitrate, silicate, and nitrite were obtained at

22 deep hydrographic stations in addition to other hydrographic and bathymetric observations. Data from N and S transects suggest that there is a south-westward flow of water into the W end of the basin. Special near-surface casts were made at 5 stations to determine the effect of ice crystals on the measurement of salinity in sea ice. The results obtained earlier from the Aries expedition and Discovery II in shallower waters are compared to those received from the Northwind.

J-11604
Houtz, R.E.
USNS ELTANIN CRUISE 52: ROSS SEA SHELF GEOPHYSICAL SURVEY. Antarctic journal of the United States, July-Aug. 1972 7(4), p.125-126
G845.A56

USNS Eltanin Cruise 52 began at McMurdo Station on Feb. 28, 1972, and ended at Lyttelton, N.Z., on March 27, 1972, after 9,984 km of intensive geophysical survey work, mostly on the Ross Sea continental shelf. Seismic profiler, gravity meter, and magnetometer data were collected during the 6,500-km shelf survey; 34 sonobuoys were successfully deployed on the shelf and the rise. Except for a region near 74 deg 30 min S and 180, where the sediments are only 200 to 300 m thick, the basement is covered by one to four km of sediment. The hydro work at 10 stations was undertaken to better determine the outflow of cold bottom water from the Ross Sea shelf. Fifty-four casts were completed and analyzed to measure biomass and metabolism.

J-11605
Eittreim, S.L.
ROBERT D. CONRAD CRUISE 15, VALPARAISO TO PUNTA ARENAS. Antarctic journal of the United States, July-Aug. 1972 7(4), p.126-127, 1 refs.
G845.A56

Measurements made during Robert D. Conrad Cruise 15 from Dec. 5 to 31, 1971, included seismic profiling, gravity, magnetics, and echo sounding. At stations between Valparaiso and Punta Arenas through the Drake Passage, which were taken roughly daily, observations and samples included a piston core, bottom photographs, a vertical nephelometer profile, and a secchi disk measurement. In the SW Drake Passage an axis of a symmetry in the magnetic anomaly pattern was found corresponding to the crest of a sediment-free ridge. Three crossings were made of the Shackleton fracture zone in the passage, confirming its existence as a major topographic feature of the Drake Passage, connecting the southernmost spur of the South America continental shelf to Elephant Island of the South Scotia Ridge. Two site surveys conducted near the antarctic continental margin established the existnce of consistent magnetic patterns over the survey areas.

J-11621
Callahan, J.E.
STRUCTURE AND CIRCULATION OF DEEP WATER IN THE ANTARCTIC. Deep-sea research, Aug. 1972 19(8), Johns Hopkins University. Chesapeake Bay Institute. Contribution No. 159, p.563-575, 23 refs.
GC1.D25

The circulation of deep water in the Antarctic and Subantarctic zones is analyzed using maps showing the depth, salinity, and dissolved-oxygen concentration on the 50- and 30-cl/t isanosteric surfaces south of 40S. The 50-cl/t surface coincides with the vertical dissolved-oxygen minimum which marks the upper Circumpolar Deep Water. The sources of the low-oxygen water are in the eastern South Pacific Ocean and in the western Indian Ocean. The 30-cl/t surface lies in the deep salinity maximum which originates in the North Atlantic Ocean and spreads through much of the Southern Hemisphere via the circumpolar circulation. The deep western boundary current of the South Pacific Ocean stands out clearly on this surface; there is tentative evidence of a similar feature in the Indian Ocean. (Auth.)

J-11707
Frakes, L.A.
PALEOCLIMATOLOGY OF THE SOUTHERN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.189-190, 9 refs.
G845.A56

Bottom sediments, cored and dredged by Eltanin, have been studied in an effort to deduce physical and chemical conditions in the ancient water column and on the seafloor and their effects on life, and then to relate these especially to oceanic circulation systems of the past. A model for near-shore sedimentation in the polar regime has been developed using this approach, and another is being prepared to relate the midocean situation to the near-shore model. It is expected that detailed study of near-shore marine sediments around the continent will supply the answer to the question of the earliest glaciation in Antarctica.

J-11708
Kemp, E.M.
RECYCLED PALYNOMORPHS IN CONTINENTAL SHELF SEDIMENTS FROM ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.190-191, 14 refs.
G845.A56

Bottom sediments from the continental shelf around Antarctica frequently contain abundant recycled spores, pollen, and dinoflagellates. This palynological material is assumed to derive from the erosion of older strata on, or close to, the Antarctic Continent and from the abrasive action of glaciers, and to have been transported seaward by ice-rafting mechanisms. The assemblages provide useful data concerning the paleontology and paleoclimatology of Antarctica. Detailed examination of samples from the Ross Sea indicates Permian, Triassic, and Early Tertiary spores and pollen and Early Tertiary dinoflagellates. Microfossils from the Weddell Sea fall into three age groups - Permian, Early Cretaceous, and Late Cretaceous-Early Tertiary. Pollens that are zonal indices for the Paleocene to Middle Eocene in Australia and New Zealand are abundant in palynomorphs recovered near Prydz Bay, East Antarctica.

J-11709
Mandra, Y.T. , Brigger, A.L.
PLATE TECTONICS, PALEOMAGNETISM, TROPICAL CLIMATE, AND UPPER EOCENE SILICOFLAGELLATES. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.191-193, 5 refs.
G845.A56

Brief report is made of the application of the silicoflagellate ratio method to determine paleotemperatures as it relates to one set of proposed paleolatitudes in a large picture of plate tectonics paleomagnetism as suggested by Phillips and Forsyth (1971). The silicoflagellate fossils used in this study are from the following Upper Eocene localities: two

South Atlantic deep-sea cores at approx 51 deg S, 48 deg W; outcrops of shale in the Mt. Diablo area of central California at approx 37 deg N, 121 deg W; and numerous outcrops of the Oamaru diatomite, South I., N. Z., at 45 deg S, 171 deg E. All four Upper Eocene localities clearly indicate tropical climate. There is no explanation for the apparent wide-spread tropical zone in the Southern and Northern Hemispheres during the Upper Eocene.

J-11710
Bandy, O.L.
BIOSTRATIGRAPHIC AND PALEOMAGNETIC STUDIES OF ELTANIN SAMPLES, 1971-1972. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), Southern California. University. Department of Geological Sciences. Contribution No.295, p.193-194, 3 refs.
G845.A56

Biostratigraphic and paleomagnetic studies are under way on cores from Eltanin Cruises 39, 45, and 47. Polar front planktonic indices include the important form Globigerina bulloides concinna Reuss together with the appearance of the antarctic variant of Globorotalia pachyderma (Ehrenberg). The origin and development of G. pachyderma as an index in paleooceanography has been documented.

J-11711
Bandy, O.L.
VARIATIONS IN GLOBIGERINA BULLOIDES D'ORBIGNY AS INDICES OF WATER MASSES. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), Southern California. University. Department of Geological Sciences. Contribution No.294, p.194-195, 3 refs.
G845.A56

Assemblages of Globigerina bulloides in Eltanin cores and samples from the southern oceans show three variations of normalforms: (1) those with four chambers in the final whorl and with a small aperture similar to G. bulloides praebulloides Blow, (2) typical forms with four chambers and with a large aperture defined as G. bulloides bulloides d'Orbigny, and (3) those with four and one-half to five chambers in the final whorl and with a larger aperture referred to G. bulloides concinna Reuss. Kummerforms may occur in any of the three subspecies. Tropical, temperate, and Polar Front zone forms are discussed, including their important associations, i.e., Globorotalia pachyderma (Ehrenberg).

J-11712
Theyer, F.
PALEOMAGNETISM AND PLANKTONIC ZONATION OF LATE NEOGENE SUBANTARCTIC CORES. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), Southern California. University. Department of Geological Sciences. Contribution No.300, p.195-197, 11 refs.
G845.A56

A detailed paleomagnetic and biostratigraphic study of 18 predominantly Gilbert-Gauss (2.4 to 5.0 m.y. ago) aged deep-sea cores collected during Eltanin Cruise 39 in the Australian-New Zealand antarctic sector has been completed. A number of radiolarian and planktonic foraminiferal zones have been proposed and correlated with previous zones. The material reflects the transitional faunal character of the Gauss Magnetic Epoch; several radiolarians, foraminifers, and diatoms of Miocene affinities become extinct and Pliocene-Holocene lineages appear.

J-11713
Kaesler, R.L. , Lohman, K.C.
DEPTH DISTRIBUTION OF POPULATIONS OF KRITHE PRODUCTA (OSTRACODA). Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.197-198
G845.A56

To determine if morphology of K. producta changes with depth in relatively shallow water, a suite of 26 samples was collected during Hero cruise 69-5. Empty valves of K. producta were found at all depths along the traverse except at 100 m. Coinciding with this discontinuity in distribution was a marked discontinuity in size of the specimens. With few exceptions, specimens from a depth of 75 m and above were small and had heavy valves. At depths of 125 m and below, specimens tended to be large, with thinner valves relative to their size. The variation in size was not simply a trend toward larger size but a markedly discontinuous distribution suggesting two separate populations that are at least partially geographically isolated from each other.

J-11714
McCollum, D.W.
NEOGENE GENUS TRINACRIA AS A STRATIGRAPHIC MARKER IN SOUTHERN OCEAN SEDIMENTS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.198-199, 12 refs.
G845.A56

Two species of Trinacria Heiberg--T. pileolus and T. excavata-- have been found in portions of Eltanin cores that have been dated as lower Gilbert Epoch 5. The genus is known only from fossil deposits and is composed of 39 species including the two reported here. The two species are relatively large and distinctive in shape, making them readily identifiable in gross core descriptions and study.

J-11715
Fillon, R.H.
LATE CENOZOIC PALEO-OCEANOGRAPHY. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.199-200, 10 refs.
G845.A56

Paleomagnetic, paleontological, and sedimentological studies have been conducted on 64 piston cores taken from the continental shelf and slope within and just to the north of the Ross Sea during Eltanin Cruises 27 and 32. A refined depth zonation consisting of five depth zones is recognized based on calcareous and arenaceous benthic foraminiferal assemblages. Ages for 20 cores have been determined using paleomagnetic polarity patterns and radiolarian biostratigraphy. An assumed major change in the nature of the Ross Ice Shelf some time after the early Matuyama is consistent with the evidence of increased bottom water production at that time. It is probable, therefore, that cores obtained from beneath the ice shelf will reveal relatively coarse late Matuyama and Brunhes sediments.

J-11716
Watkins, N.D.
PALEOMAGNETIC SURVEYS OF AMSTERDAM AND ST. PAUL ISLANDS, SOUTH INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.200-201, 4 refs.
G845.A56

Preliminary results of paleomagnetic surveys of Amsterdam and St. Paul Is. show that all lavas

examined are normal polarity, consistent with an age of less than 0.7 m.y. Geomagnetic and geochemical analyses of the data are in progress.

J-11717
Watkins, N.D.
PALEOMAGNETIC, GEOCHEMICAL, AND ISOTOPIC ANALYSIS OF ROCKS FROM KERGUELEN ISLAND, SOUTH INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.201-202, 1 ref.
G845.A56

Paleomagnetic, petrographic, geochemical, potassium-argon, and rubidium-strontium isotope analyses have been completed on basaltic rocks collected from the Kerguelen archipelago and will be published in 1973. The results have been analyzed in the context of the microcontinental hypothesis.

J-11718
Watkins, N.D. , Kennett, J.P.
CONTINUING PALEOMAGNETIC AND MICROPALEONTOLOGICAL DATING OF ELTANIN DEEP-SEA SEDIMENTARY CORES. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.202-203, 5 refs.
G845.A56

Sedimentation rates are being determined for all Eltanin deep-sea sedimentary cores, using a combination of paleomagnetic and micropaleontological methods. Major discoveries are an overall, sedimentation rate pattern that is related to the configuration of the midoceanic ridge system and a region of scour that is concentrated on the south Tasman Sea. Measurements are in progress on the concentration of atmospherically transported volcanic dust in traverses of Eltanin cores.

J-11719
Houtz, R.E.
ELTANIN GEOPHYSICAL PROGRAMS, CRUISES 48, 49, 50 AND 52. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.204
G845.A56

Magnetic, seismic reflection, and gravity data were continuously recorded aboard the Eltanin during the period under review. The information is dependent upon the quality of the navigational inputs, which are carefully recorded by the geophysics personnel and reconciled by use of the IBM 1130 computer to produce shipboard plots. About 150 velocity solutions from sedimentary layers and basements were obtained in antarctic waters aboard Eltanin. These solutions can be used to compute the total thickness of the sediment cover. The research activities of the four cruises are briefly summarized.

J-11720
Kennett, J.P. , Brunner, C.A.
ASSOCIATIONS BETWEEN ANTARCTIC GLACIAL HISTORY AND BOTTOM WATER ACTIVITY. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.204-205, 9 refs.
G845.A56

Climatic fluctuations associated with glacial episodes are considered to have had a profound effect on deep-ocean circulation. This results from an increase in the production of bottom water through greater production of sea-ice and floating shelf ice and from an increase in circumpolar flow due to an intensified high latitude climatic regime. At these times an increase in sea floor erosion and sediment redistribution occurs as a result of intensified circulation, increased chemical dissolution, and increased benthic standing crop and activity. Recent studies have revealed an Eltanin core ranging in age from the latest Miocene to earliest Pliocene, which is the oldest known Late Cenozoic core containing ice-rafted debris. Studies of the core indicate that during the early part of the Late Cenozoic there was probably an increase in the degree of antarctic glaciation, as reflected in the amount of ice-rafting, as well as an increase in bottom current activity.

J-11721
Gordon, A.L.
ANTARCTIC PHYSICAL OCEANOGRAPHIC STUDIES 1971-1972. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.206-207, 2 refs.
G845.A56

Oceanographic data were collected on Eltanin Cruises 48 to 50, 52, and 53 during the 1971-72 period. Studies of Antarctic Bottom Water (AABW) clearly demonstrate that 1) the Weddell Sea is not the sole source of AABW; 2) there are two types of AABW, a low salinity and a high salinity variety; and 3) the production of AABW is a continental margin process with strong time dependence. Other research during the period has included the development of a model for AABW formation, descriptive studies and numerical models of flow patterns of the Antarctic Circumpolar Current in the region of the Macquarie Ridge, and studies of the dynamic topography of antarctic surface waters.

J-11722
Woodruff, J.L. , Margolis, S.V.
SIZE ANALYSIS OF ELTANIN CORES BY USE OF A PHOTOMETRIC CENTRIFUGE. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.207-208, 4 refs.
G845.A56

The photometric centrifuge produces a continuous plot representing grain size distribution of sediment from 44 to 4 microns in less than 5 minutes. This method is being used in combination with scanning electron microscopy to relate variations in the size distribution, composition, and origin of fine-grained deep-sea sediments to the paleo-oceanographic and paleoglacial history of Antarctica. Eltanin cores from the sector of approx 170 deg E to 120 deg W within latitudes 74 deg to 57 deg S show a wide variation in the mean grain size of the fine fraction. The coarsest means occur closest to Antarctica and farthest from the continent, between the Antarctic convergence and the iceberg limit, while the finest value was found at about 65 deg S.

J-11723
Fairhall, A.W. , Bradford, P., Young, A.W.
CARBON-14 CONCENTRATIONS IN THE SOUTHERN OCEANS. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.208-209, 1 ref.
G845.A56

Carbon-14 concentrations were plotted as a function of nonlinear depth for a number of stations in the ocean south of Australia and in the southeastern Pacific Ocean during Eltanin Cruises 38, 39, and 43. The natural C-14 concentration in the southern oceans was determined to be 1.4 plus or minus 0.02 x 10 exp 9 Carbon-14 atoms per liter independent of depth. Radioactive decay was presumably balanced by a rain of organic matter, and carbonate tests, from

the surface with dissolution at depth. The influence of bomb C-14 to depths of 1,000 m was apparent.

J-11775
Chikovskii, S.S.
SUPERCOOLING OF SEA WATER UNDER NATURAL AND LABORATORY CONDITIONS. Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Transactions (Trudy), Vol.300. IAkovlev, G.N., ed., Ice physics and ice engineering, Jerusalem, Israel Program for Scientific Translations, 1973, p.121-134, TT 72-50005, For Russian original see 26-1976 or J-10440. 35 refs.

Supercooled sea water under laboratory conditions and in the Arctic and Antarctic under favorable conditions, occurring as open water with strong currents, low air temperature at the surface, and strong wind, was studied. The values of supercooling (the difference between liquid and freezing temperatures at the same salinity) in polynyas of Leningrad and Alasheyev Bights in the 0.5-m surface water layer range from 0.30 to 0.40 C, at the surface water film they reach 2.0 or more, and under the ice (Mirnyy region) the values decrease to 0.03 to 0.04 C. In deep-water regions (Weddell Sea, McMurdo Sound, and Davis Sea) supercooled water is found at depths of several hundred meters.

J-11778
Gershanovich, D.E. , Dmitrienko, A.I.
NEW DATA ON GEOMORPHOLOGY OF THE SCOTIA SEA. Novye dannye o geomorfologii moria Skotiia. Geomorfologiia, 1972 No.3, p.57-64, In Russian with English summary. 19 refs.

Differences in the relief of the Birdwood basin (western part of the Scotia Sea) and the South Orkney basin (eastern part of the Sea) are discussed. General characteristics of three systems of deep water troughs in the sea are given. The distribution of the systems is associated with the island slope of the South Antilean threshold, facing the Scotia Sea, and a possible rift zone in the west of the Sea. The deep water troughs of the Scotia Sea are supposed to be of some other origin, than the South Sandwich deep water trough, bordering from the outside the youngest part of the South Antilean trough - the South Sandwich island bow.

J-11788
Sheldon, R.W. , Prakash, A., Sutcliffe, W.H., Jr.
SIZE DISTRIBUTION OF PARTICLES IN THE OCEAN. Limnology and oceanography, May 1972 17(3), Bedford Institute (Nova Scotia) Contribution, p.327-340, 42 refs.
GC1.L5

Water samples were collected from the Atlantic, Pacific, and Southern Oceans for particle size determinations. Frequency distributions of particle size between sizes of about 1 and 100 microns are given for both surface and deep water of the Atlantic and Pacific Oceans. The form of the size spectra varies predictably both geographically and with depth. The concentration of particles in the South Atlantic Ocean to the S of latitude 50 deg, beyond the Antarctic Convergence, was high and relatively large particles formed the greatest bulk of material. These were mainly diatoms. The pattern of occurrence of particle size spectra was similar in the South Pacific except that the concentrations of particles to the south of the Antarctic Convergence was less than that found in the South Atlantic. A hypothesis is presented to show that, to a first approximation, roughly equal concentrations of material occur at all particle sizes within the range from 1 micron to about 1,000,000 microns, i.e. from bacteria to whales.

J-11792
Carpenter, R. , Johnson, H.P., Twiss, E.S.
THERMOMAGNETIC BEHAVIOR OF MANGANESE NODULES. Journal of geophysical research, Dec. 20, 1972 77(36), University of Washington. Department of Oceanography. Contribution No.671, p.7163-7174, 22 refs.
QC811.J6

Marine and fresh water ferromanganese nodules have magnetic moments of 0.1-0.5 emu/g in a 7.2-koe field at room temperature corresponding to upper limits of 0.1-0.6 percent maghemite and magnetite in particles greater than superparamagnetic. Hysteresis loops at 20C show that the nodules contain predominately paramagnetic phases, but at least small amounts of ferrimagnetic phases are evident in the loops of all samples. The antarctic nodules contain the largest amounts of ferrimagnetic phases. Fourteen of sixteen marine nodules from <2400 meters water depth and roughly half the nodules from greater depths showed only the decrease in magnetism on heating that is characteristic of paramagnetic phases. The other marine nodules showed, in addition, a Curie point of about 580C. The antarctic samples were richest in this 580C phase. On cooling, the marine nodules show strong increases in magnetization with Curie points of 100-200C that are attributed to the formation of jacobsites. The heating cycle does not complete the jacobsite formation reactions, and equilibrium is not reached.

J-11815
Ewing, M. , Carpenter, G., Windisch, C., Ewing, J.
SEDIMENT DISTRIBUTION IN THE OCEANS: THE ATLANTIC. Geological Society of America. Bulletin, Jan. 1973 84(1), p.71-87, 38 refs.
QC811.J6

Seismic reflection and refraction data from about 750,000 km of traverse in the Atlantic Ocean are used to construct a sediment isopach map. Sediment distribution is largely controlled by sea-floor spreading and proximity to continental sources. The thinnest sediments are confined to the axial zone of the mid-Atlantic ridge primarily because of the youth of this region. Sediments progressively thicken down the flanks and into the basins-a pattern in accord with sea-floor spreading theories. Average sediment thickness is about 1.0 km for the North Atlantic and about 0.7 km for the South Atlantic, a difference fundamentally attributed to the relative youth of the southern basin. In the southern portion of the Atlantic, the flow of Antarctic bottom water (AABW) strongly affects sedimentation, particularly in the western basins. The northward flow of AABW through the Falkland gap is constrained both by regional physiography and by the Coriolis effect. For the most part, these constraints restrict flow to the area west of the mid-Atlantic ridge dominated by the Argentine basin.

J-11856
Hayes, D.E. , Talwani, M., Houtz, R., Pitman, W.C., III
PRELIMINARY REPORT OF VOLUME 22; U.S.N.S. ELTANIN CRUISES 28-32 MARCH 1967-MARCH 1968. PART A: NAVIGATION. PART B: BATHYMETRIC, GEOMAGNETIC, AND GRAVITY PROFILES. PART C:

SEISMIC REFLECTION PROFILES. Columbia University. Lamont-Doherty Geological Observatory. Technical report, May 1972 CU-1-72, p.1-200, Refs. p.9-13

The data presented in this report and those obtained on other Eltanin cruises constitute a significant portion of all existing marine geophysical measurements for high latitudes in the Southern Ocean. Part A contains index maps showing the ship's track with distances indicated at 100 mi intervals, and tabulations of navigational information. The topographic, geomagnetic, and gravity profiles in Part B are plotted with respect to distance, which is annotated at intervals of 200 nautical mi, with indications of any changes in course or speed. The seismic profiler data in Part C are presented as reduced photocopies of the original recordings. All bathymetric, gravimetric, magnetic, and navigational data were digitized and reduced with the aid of an IBM 1130 digital computer and on-line Calcomp plotter. The instrumentation used in various studies is briefly described.

J-11857
Talwani, M. , Meijer, R.R., II
PRELIMINARY REPORT OF VOLUME 22; U.S.N.S. ELTANIN CRUISES 28-32 MARCH 1967-MARCH 1968. GRAVITY MEASUREMENTS ELTANIN CRUISES 28-32. Columbia University. Lamont-Doherty Geological Observatory. Technical report, May 1972 CU-1-72, p.201-232, 13 refs.

The gravity data collected during Eltanin cruises 28-32 are summarized and the instrumentation described. The equipment consisted of a Graf Askania Sea Gravimeter and an Anschutz gyrotable. A system for signal monitoring and analog computation of the cross coupling error was also installed.

J-11865
Anderson, J.B.
NEARSHORE GLACIAL-MARINE DEPOSITION FROM MODERN SEDIMENTS OF THE WEDDELL SEA. Nature physical science, Dec. 25, 1972 240(204), p.189-192, 10 refs.
Q1.N22

Study of modern deposits collected during the 1968, 69 and 70 International Weddell Sea Oceanographic Expedition has shown that contrasting glacial and oceanographic conditions are reflected in the present sedimentologic and faunal distributions. There is evidence that both dry-base (freezing) and wet-base (thawing) ice shelves presently exist in the Weddell Sea. Saline shelf waters believed to be formed by a freezing Ronne Ice Shelf comprise the dominant water mass of the southwestern continental shelf. At the southwestern continental slope these dense, shelf waters mix with warm deep waters to form Antarctic Bottom Water. Fresh shelf waters east of Crary Trough suggest wet-base conditions for the Filchner and Brunt Ice Shelves. Sediments range from gravelly sands and clean, well sorted sands to gravelly mud, sandy mud, and mud. The diverse benthic foraminifera comprising the various faunal facies and the relation between the dominant bottom water masses and foraminiferal facies of the Weddell Sea are shown. Also, a model is developed illustrating proposed changes in sedimentation and foraminiferal facies for a complete cycle from advancing dry-base (early glacial?) to receded wet-base (late interglacial?) regimes in an ice shelf environment.

J-11906
Kuksa, V.I.
SOME PECULIARITIES OF THE FORMATION AND DISTRIBUTION OF INTERMEDIATE LAYERS IN THE INDIAN OCEAN. Oceanology, Nov. 1972 12(1), p.21-30, Translation from: Okenologiia, 12(1):26-37, Jan.-Feb. 1972. 22 refs.

Data obtained during deep-sea observations in the Indian Ocean, including the sub-Antarctic region, were averaged over five-degree latitude-longitude squares and T-S curves were plotted from the annual average values. These curves were used to determine the salinity extremes and corresponding density values. The density variations were also determined for the vertical boundaries of the intermediate layers. The characteristics obtained made it possible to establish the horizontal limits of intermediate layers and identify the structural types of ocean waters. A statistical estimate of the spatial variability of density in the cores of intermediate layers and at their vertical boundaries confirms the assumption that the propagation of oceanographic characteristics at intermediate depths in the Indian Ocean is isopycnic in nature. It is concluded that the density field at these depths is constant not only seasonally, but also from year to year.

J-11908
Bookstone, M.
ICE-RAFTED SEDIMENT -- AN AGE DETERMINATOR OF LATE PLEISTOCENE ANTARCTIC CONTINENTAL GLACIATIONS. Gradient, Spring 1972 Vol.1, p.15-22, 10 refs.

A new method for determining the number and ages of late Pleistocene antarctic continental glaciations is devised by considering sedimentation rate as a function of the relative concentrations of ice-rafted terrigenous material in deep-sea sediment cores. Paleomagnetic stratigraphy and faunal extinctions are utilized as time lines for correlation purposes. The cores studied, Eltanin 11-4, 8, 12, and 13, were taken in a line across the Bellingshausen Basin of the Antarctic Ocean between 55 and 70 S latitude. Evidence suggests glacial marine debris is deposited toward the end of continental glaciations. (Auth. mod.)

J-11973
Bunt, J.S. , Lee, C.C.
OBSERVATIONS WITHIN AND BENEATH ANTARCTIC SEA ICE IN MCMURDO SOUND AND THE WEDDELL SEA, 1967-1968. NSF Grant GA-724, Coral Gables, Fla., University of Miami, Institute of Marine Sciences, April 1969, 32p., 10 refs.

The purpose of this report is to list data obtained at McMurdo Sound between mid-winter and Dec. 1967 and during the First International Weddell Sea Expedition, 1968, in connection with studies of primary productivity in and beneath sea ice and pack ice. In addition field and laboratory techniques used in circumstances demanding departure from procedures commonly followed in such investigations in more temperate waters are described. Using SCUBA equipment for sampling the ice layer, measurements were made of light penetration and a number of hydrological parameters including pH, temperature, salinity, oxygen, phosphate, nitrate, and nitrite. In addition, the magnitude of algal populations was monitored, photosynthetic activities were measured in the laboratory and filtered particulate materials used for analysis of chlorophyll a, organic carbon and nitrogen.

J-11982
Lee, B.D.
DISTRIBUTION AND ABUNDANCE OF PELAGIC COPEPODS IN THE DRAKE PASSAGE AND OFF THE COAST OF ARGENTINA, WITH SPECIAL REFERENCE TO HYDROLOGY OF THESE AREAS. Texas. A and M University. Dept. of Oceanography and Meteorology. Technical report. A & M Project 398. Reference 66-1-T, Texas A & M University, Jan. 1966. 410p., Refs. p.237-251. Dissertation.

Hydrological studies made in the Drake Passage between Feb. 1963 and July 1964 indicated that the position of the Antarctic Convergence does not show appreciable displacement from its mean position between 58 and 59 S latitude in the Passage. Lower temperatures, higher dissolved oxygen content, and increased silicate values were noted as the Antarctic Convergence was crossed from north to south. Based on the plankton samples studied, it was possible to divide the areas investigated into four regions: Antarctic, Subantarctic, transitional, and subtropical. Highest zooplankton volumes occurred between 40 and 45 S latitude. The zooplankton-phytoplankton relationships in the oceanic and neritic regions are discussed and taxonomic notes on most of the 96 species of copepods found are included.

J-12025
Kudriavtsev, N.P.
APERIODIC SEA-LEVEL FLUCTUATIONS IN ARDLEY INLET. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.153-154. Translated from its Informatsionnyi biulleten', No.81, 1970.

Sea level fluctuations were measured in Ardley Inlet by the Fourteenth Soviet Antarctic Expedition in continuation of a program begun in 1968. Fluctuations of average monthly levels of maximum and minimum levels during 1968-69 are graphed. Average monthly levels varied about 30 cm. Maximum variations in average daily levels may reach 60 cm, while the maximum difference between the highest and lowest tide was 84 cm over the entire observation period. All distortions of sea level in this area are produced by a complex interaction of the wind field with the sea surface over adjoining ocean areas, which produces tidal effect in level fluctuations at the coast of the island. The amplitude of these fluctuations can be tentatively estimated at about 1m.

J-12062
Lovelock, J.E. , Maggs, R.J., Wade, R.J.
HALOGENATED HYDROCARBONS IN AND OVER THE ATLANTIC. Nature, Jan. 19, 1973 241(5386), p.194-196, 6 refs.

During the past few decades the production of the chlorofluorocarbons, the propellant solvents for aersol dispensers, has grown exponentially. The presence of the two principal compounds of the class, CCl2F2 and CCl3F, constitutes no conceivable hazard; the interest lies in their potential usefulness as inert tracers for the study of mass transfer processes in the atmosphere and oceans. The voyage of the RRS Shackleton from the United Kingdom to Antarctica and back in 1971-1972 provided an excellent opportunity to compare the observed global distribution of CCl3F with the predicted distribution from models of the behavior of an ideal inert gas. Additionally the apparatus used gave simultaneous measurements of two unexpected halomethanes: methyl iodide and carbon tetrachloride. These two compounds and CCl3F were uniformly distributed both in air and sea. The observed and predicted global mean concentrations (per trillion by volume) were 48 and 53 respectively, which are in close agreement.

J-12063
Edmond, J.M.
SILICA BUDGET OF THE ANTARCTIC CIRCUMPOLAR CURRENT. Nature, Feb. 9, 1973 241(5389), p.391-393, 27 refs.

The silica budget of the Antarctic Circumpolar Current was studied in an effort to resolve the question of whether the current is a major source of dissolved silica arising from the dissolution of glacier flour or a sink due to sedimentation of diatomaceous opal. The distribution of silica in the World Ocean is greatly influenced by biological factors. It forms the tests of radiolaria and diatoms which grow mainly in the surface waters. The resulting particulate phases, tissue, protoplasm and tests sink across the thermocline mixing-barrier into the deep waters: a variety of biological and inorganic mechanisms act to oxidize and redissolve a large fraction of this material both while it is sinking through the water column and while it is resting on the bottom. The net chemical effect of this process is to separate the biologically active and inactive dissolved components. The distribution of the latter is largely controlled by the mechanisms of primary injection, continental runoff, submarine weathering, precipitation and absorption, and the physical hydrodynamic processes of mixing and transport. Biological activity, however, acts to "strip" the required dissolved constituents from the surface layer and inject them into the deep layer. The return of both active and inactive components to the upper waters is by the same physical mechanisms. Calculations show clearly that the Antarctic diatomites represent a net sink for silica and that no local injection is required in order to maintain the steady state situation: a massive source of silica from glacial sediments is ruled out.

J-12110
Granholm, N.H.
CONVERGENCE AND KRILL: THE AMAZING PRODUCTIVITY OF THE ANTARCTIC OCEAN. Oceans, Jan.-Feb. 1973 6(1), p.46-51

The fertility of Antarctic waters is complex and involves many physical and biological factors such as light levels, water temperature, salinity, gaseous saturation in water, nutrient levels, water circulation, ocean currents, growth rates of the biota, and biological adaptations to polar regions. One factor is of primary importance. The overwhelming productivity of these waters could not occur without the exchange of northerly-moving Antarctic water with warmer, southerly-moving Subantarctic waters at the Antarctic Convergence. An upwelling of gigantic proportions occurs and sets the stage for lush productivity. Marine biota enhance the productivity of their waters through various biological adaptations including staggered breeding cycles, increased longevity, increased size per organism, slower growth rates, and seasonal and diurnal vertical migrations. Life cycles of certain zooplankters such as Euphausia superba, an important link in the Antarctic food chain, demonstrate how supremely adapted some of them are to their polar environment and how, in many subtle ways, they further enrich the Antarctic Ocean.

J-12131
Mordasova, N.V.
CHLOROPHYLL CONTENT OF WATER AND ICE IN THE

ANTARCTIC. Soderzhanie khlorofilla v vode i l'dakh Antarktidy. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy molodykh uchenykh, 1970 No.3, p.36-44, In Russian with English summary. 4 refs.
SH1.M66

Samples of fast and continental ice taken at Mirnyy Station, of snow and water from various sections of fast ice, of water taken at the ice edge, of icebergs, and of ice and snow from Kitezh Lake (King George I.) were analyzed for chlorophyll content. The greatest amount of chlorophyll "a" was found in ice samples from the underwater congelation layer (60.49 mkg/l), and only traces of it were present in ice and snow of icebergs. The samples with the highest levels of chlorophyll "a" also show the highest concentrations of phosphates, nitrates and ammonium nitrogen. Spectrophotometric analyses indicate that phytoplankton in Antarctic ice contains mainly chlorophyll "a" (73.3 %), while chlorophyll "b" and "c" occur in negligible amounts.

J-12132
Dmitrienko, A.I.
MORPHOLOGY OF TROUGH VALLEYS OF THE NORTHERN PART OF THE SCOTIA RIDGE. K morfilogii trogovykh dolin severnoi chasti IUzhno-Antil'skogo poroga. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy molodykh uchenykh, 1970 No.3, p.52-56, In Russian with English summary. 4 refs.

One of the most typical trough valleys of the Scotia Ridge is located E of South Georgia and stretches for 23 mi from SW to NE. Three parts, differing in the relief amplitude of the submarine valleys, the breadth of the bottom and the steepness of the slope, can be distinguished in the slope topography: the southern one, which is most narrow, has gentle slopes and a slightly undulated bottom, the central one, characterized by maximum depth, very steep and dissected slopes, and the northern estuarine one, with the broadest bottom and minimun depth. Bottom sediments are composed of dark-green mud with admixture of coarse detritus. The structure of the valleys suggests their tectonic origin. Oceanographic conditions contribute to the development of high biological productivity in such valleys and make them suitable grounds for trawling operations. (Auth. mod.)

J-12133
Dmitrienko, A.I.
BOTTOM RELIEF OF THE EASTERN SCOTIA SEA. O rel'efe vostochnoi chasti moria Skotiia. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy molodykh uchenykh, 1970 No.3, p.57-71, In Russian with English summary. 3 refs.

The main features of the bottom topography of the eastern Scotia Sea are systems of submarine ridges, presumably of a submeridional direction, alternating with flat and undulating abyssal plains. Insular shelves, which are clearly dissected, stretch to a depth of 250-350 m. The largest topographic forms, dissecting the shelf, are trough valleys. The structure of insular slopes in the given area is rather complex. As a rule, they are quite steep and terraced, dissected by submarine canyons and valleys. The central part of the deep-sea basin is occupied by an extensive upland. Abyssal plains lie in the southern and northern parts of the area. The topographic structure of the southeastern part of the deep-sea basin, with its numerous ridges, is especially complex. (Auth. mod.)

J-12139
Lisitsyn, A.P. , Lin'kova, T.I.
PALEOMAGNETIC AND LITHOLOGIC INVESTIGATIONS OF BOTTOM SEDIMENTS OF THE SOUTHERN PART OF THE INDIAN OCEAN. International geology review, Jan. 1973 15(1), p.75-79, Translated from Akademiia nauk SSSR. Izvestiia. Seriia geologicheskaia, No.1:129-134, 1972. 5 refs.
For abstract see J-11524.

J-12149
American Geographical Society , Heezen, B.C., Tharp, M., Bentley, C.R.
MORPHOLOGY OF THE EARTH IN THE ANTARCTIC AND SUBANTARCTIC. American Geographical Society. Antarctic map folio series. Folio 16, New York, 1972, 16p. + 8 maps, Refs.

This map folio contains 8 plates and a text. The text first considers the data and concepts on which the cartographic interpretations are based, then discusses the construction of the bathymetric charts, features of the sea floor, plate motion and bathymetry, the Scotia Sea, and subglacial rock surface topography. The 8 plates are maps depicting the topography of the sea floor and the rock beneath the Antarctic ice sheet; the tracks along which depth soundings were obtained and the locations of earthquake epicenters; physiographic and tectonic provinces; the submarine topography of the Scotia Sea; profiles of the sea floor; the subglacial topography of Antarctica; and the tracks along which subglacial soundings were made.

J-12159
McWhinnie, M.A.
FLOATING LABORATORY IN WATERS OF ANTARCTIC. Antarctic, Dec. 1972 6(8), p.278-279

Built in 1957 to serve in Arctic resupply, the Eltanin was converted to a floating laboratory for antarctic research in 1962. Her conversion provided six research labs, a photographic darkroom, a computerized data processing center, scientists' office, machine and carpenter shop, and an electronics shop. Satellite navigation equipment enables precise determination of at-sea locations. The ship accomdates 28 scientists, 10 technical supporting staff, and a crew of 48 men. The Eltanin is equipped for research in a number of scientific areas, including marine geology, physical hydrography, seismology, chemical and physical oceanography, upper atmospheric phenomena, meteorology, and marine biology. Life and work aboard the vessel and the part she plays in antarctic research are described.

J-12181
Tsunogai, S. , Yamazaki, T., Nishimura, M.
CALCIUM IN THE ANTARCTIC OCEAN. Oceanographical Society of Japan. Journal [Nihon kaiyo Gakkaishi], Oct. 1971 27(5), p.191-196, In English with Japanese summary. 16 refs.

Calcium in sea water was determined in samples taken from the Antarctic and Indian Oceans. Surface water commonly contains less calcium relative to chlorinity than does deep water. The tendency, however, is very faint in the Antarctic Ocean. In the surface waters, the Ca/Cl ratio is lower in the tropical and subtropical waters and the ratio well correlates with phosphate. The Ca/P ratio is calculated as

37 in atomic ratio. These may indicate that calcium is uptaken by organisms to make skeletal parts from surface water which is supersaturated with respect to calcite or aragonite. On the other hand, no definite correlationship between calcium and phosphate is found in subsurface water. This fact suggests that the regeneration process of calcium from organic debris is different from that of phosphate. The increase-rate of calcium in the abyssal water is estimated to be 0.18 microgm at./(1 yr), which is due to the dissolution of calcium carbonate. The rate is about half of total carbonate increase in the water. (Auth.)

J-12182
Matsuike, K. , Morinaga, T., Sasaki, T.
OPTICAL CHARACTERISTICS OF THE WATER IN THE THREE OCEANS. PART IV. ATTEMPT TO THE APPROXIMATE FIGURES OF SEASONAL SOLAR ENERGY REACHED TO AND PENETRATED IN THE WATER OF THE THREE OCEANS. Oceanographical Society of Japan. Journal [Nihon Kaiyo Gakkaishi], Feb. 1970 26(1), p.52-60, In English with Japanese summary. 21 refs.

The seasonal distribution of solar energy reaching and penetrating the waters of the Indian, North Pacific, and Antarctic Oceans has been approximated as a preliminary step to the estimation of primary production in the oceans. The total amount of solar energy for the year in each depth showed marked differences in each zone of the oceans. Underwater solar energy was estimated at 33.4 Kcal/sq cm/hr in 10 m depth in the equator of the Indian Ocean, 54 percent in the Subantarctic zone, 13 percent in the Antarctic zone, and 6 percent in the Antarctic Convergence zone. The ratio of the total photic zone for the year in unit area of sea surface was approx 100:80:60:25 or 100:75:50:20 in the equatorial zone of the Indian Ocean, the Kuroshio region, the Subantarctic zone, and the Antarctic and Antarctic Convervenge zones, respectively.

J-12231
Markl, R.G.
USNS ELTANIN CRUISE 54 TO KERGUELEN PLATEAU AND SOUTHEAST INDIAN RISE. Antarctic journal of the United States, Jan.-Feb. 1973 8(1), p.6-8, 2 refs.

Scientific operations carried out during the reconnaissance of the margins of the Kerguelen Plateau included continuous magnetics and gravity measurements, continuous 12- 3.5-kHz echo sounding and seismic reflection profiling, Nansen casts, bottom photograph and nephelometer stations, bottom current meter stations, bathythermography measurements, and sediment coring. A north-south section of 15 hydrographic stations plus 8 camera/nephelometer stations was completed east of the plateau. The antarctic and subantarctic polar fronts were located by some of the 231 bathythermograph measurements during the cruise. Three current meters were also emplaced, though 2 of these had to be abandoned, and 12 cores were taken. Several of the cores were composed entirely of chalk; some glacial-marine material was recovered. A survey of the Australian-Antarctic discordance near the crest of the Southeast Indian Rise concentrated on a portion of the discordance delimited by 123 to 126 deg E and 46 to 49 deg S.

J-12239
Gill, A.E.
CIRCULATION AND BOTTOM WATER PRODUCTION IN THE WEDDELL SEA. Deep-sea research, Feb. 1973 20(2), p.111-140, 64 refs.

A study is made of the distribution of temperature and salinity in the Weddell Sea. The main feature of the horizontal circulation is the Antarctic coastal current which enters the Weddell Sea from the east. This current leaves the coast near Halley Bay and flows along the edge of the continental shelf as a ribbon of cold fresh water between cold salty water on the shelf and the warm water characteristics of the circumpolar region. At the edge of the shelf in western Weddell Sea, there is a V-shaped double front, above which lies the cold fresh water from the coastal current. The descending cold salty water from the shelf meets the warmer fresher water of the open-ocean pycnocline at the base of the V and the two waters mix to form bottom water which then runs down the continental slope. The characteristics of the bottom water formed vary with distance along the edge of the shelf, the bottom water becoming saltier and heavier with distance westwards. Bottom water is produced throughout the year, since there is always a supply of dense water from the continental shelf. The time taken for the dense water to run off the shelf and be replaced is several years. The mechanism by which the water on the shelf acquires its salinity is discussed. It is concluded that surface processes are responsible and that there is a net brine release over the continental shelf area because the pack ice is continually being blown off shore. It is estimated that the net brine release in a year is equivalent to the freezing of 1 m or more of ice.

J-12240
Glasby, G.P.
MANGANESE DEPOSITS OF VARIABLE COMPOSITION FROM NORTH OF THE INDIAN-ANTARCTIC RIDGE. Nature physical science, April 16, 1973 242(120), p.106-108, 13 refs.

New data are reported on the morphology and composition of manganese oxide deposits from two dredge hauls taken about 500 km north of the Indian-Antarctic Ridge system in the Southern Tasman Basin during Cruise 36 of the USNS Eltanin and donated to the New Zealand Oceanographic Institute. Station Z2139 consists of a series of large angular blocks of glacial erratics (granite, diorite, gneiss) coated with a thin layer of manganese. The manganese is of variable thickness (from <1 to 2 mm) achieving maximum thickness in surface depression on the upper surface of the boulders; in certain cases, what seems to be the in situ underside of the boulder is devoid of manganese whereas the upper surface is coated with manganese. Station Z2140 consists of large quantities of nodules (30.8 kg) with only a limited number of glacial erratic blocks similiar to Z2139. The nodules display a range of morphologies reflecting the shape of the nodule nucleus and consist mainly of botryoidal nodules with a limited number of spherical, uniform nodules and a few highly distorted nodules displaying multiple nuclei. They consist of deeply weathered in situ volcanic cores coated with a thin but variable thickness (average 1 mm) of manganese. A few small erratic pebbles coated with only a surface veneer of manganese were also observed. Rates of deposition and chemical composition are discussed.

See also:
A-10054, A-11885, B-10051, B-10063, B-10279, B-10280, B-10281, B-10282, B-10283, B-10284, B-10374, B-10503, B-10572, B-10603, B-10609, B-10610, B-10705, B-10706, B-10707, B-10708, B-10709, B-10710, B-10711, B-10712, B-10714, B-10715, B-10716, B-10717, B-10718, B-10766, B-10839, B-10875, B-10940, B-10944,

B-11315,B-11376,B-11380,B-11381,B-11385,
B-11467,B-11519,B-11559,B-11563,B-11568,
B-11571,B-11692,B-11698,B-11699,B-11700,
B-11783,B-11784,B-11903,B-11944,B-11989,
B-12101,B-12124,B-12195,B-12204,D-10796,
D-10859,D-11008,D-11422,D-11936,D-11937,
E-10304,E-10305,E-10306,E-10670,E-10748,
E-10750,E-11057,E-11303,E-11377,E-11583,
E-11746,E-11819,E-11820,E-11821,E-11822,
E-12120,E-12158,F-10027,F-10028,F-10246,
F-10826,F-10833,F-10878,F-10900,F-10920,
F-11013,F-11188,F-11486,F-11771,F-11773,
G-10751,G-10810,G-11498,G-12000,I-10084,
I-10274,I-10890,I-10911,I-10937,I-11267,
I-11490,I-12214,L-10536,L-11076,L-11245,
L-11246,L-11248,L-11794,L-11866

K. ATMOSPHERIC PHYSICS

K-10004
Wakai, N. , Ose, M., Tanohata, K.
HF RADIO WAVE ABSORPTION IN THE NIGHTTIME. PART I. Antarctic record, Jan. 1971 No.39, p.1-18

Observations of the nighttime ionospheric absorption have been carried out since 1958 on board ship for antarctic research. Field intensities of the HF standard frequency signals at different frequencies were measured during the hours around midnight. In this paper, techniques of the measurement of relatively small nighttime absorption are described. Existence of the absorption is confirmed by the fact that the rate of decrease of field intensities against the ground range at a lower frequency is much larger than that at a higher frequency. Moreover, the dependence of absorption upon the solar activity has been established by the measurement over nine years in the declining epoch of the last solar cycle. A provisional expression for estimating the nighttime absorption is proposed.

K-10014
Parkinson, W.D.
ANALYSIS OF THE GEOMAGNETIC DIURNAL VARIATION DURING THE INTERNATIONAL GEOPHYSICAL YEAR. Beiträge zur Geophysik, 1971 80(2/3), p.199-232
QC801.B3

A program for the automatic analysis of diurnal variation has been developed and applied to solar quiet day variations observed during the IGY. The Fourier coefficients of the means of International Quiet Days from about 50 observatories were analyzed as functions of latitude and longitude by the Gram-Schmidt method and those that were not statistically significant were discarded. Some terms depending on longitude as well as local time were included. The zero of the variation field was taken as the local midnight value at each observatory. Current functions corresponding to the external primary field and the internal induced field were calculated for every 6 hr and for the 4 seasons. The current pattern is found to be influenced by the asymmetry of the main field. The complex ratio of internal to external potentials agrees fairly well with those derived from previous analyses, but there is an apparently significant difference between the 24-hr and 12-hr harmonics not previously reported.

K-10021
Eccles, D. , King, W., Kohl, H.
FURTHER INVESTIGATIONS OF THE EFFECTS OF NEUTRAL-AIR WINDS ON THE IONOSPHERIC F-LAYER. Journal of atmospheric and terrestrial physics, Sept. 1971 33(9), p.1371-1381, 23 refs.
QC801.J6

Ionospheric data obtained at middle latitudes during summer are compared with values of f0F2 calculated by solving simultaneously the F-layer continuity equation and the equation of motion of the neutral atmosphere. The "evening enhancements" and "midnight maxima" of f0F2 which occur over certain regions of the Earth in summer are shown to be caused almost entirely by neutral-air winds. These winds produce very different ionospheric effects at similar latitudes in the northern and southern hemispheres. Data from Argentine Is. (65S, 64W) show a "midnight maximum" near 0300 LMT. Certain day-to-day changes in the diurnal behavior of the ionosphere at sunspot minimum can be explained if the phase of the wind differs from day to day. Diurnal variations of f0F2 having different shapes are observed at different solar epochs and these can be reproduced theoretically provided that the effects of neutral-air winds are included in the calculations.

K-10025
Ponomarev, E.V. , Sverdlov, IU.L., Piatsi, A.Kh., Vershinin, E.F., Tsirs, G.P.
RADIO FREQUENCY OBSERVATIONS IN THE AURORAL ZONE. Radiofizicheskie issledovaniia v avroral'noi zone. Akademiia nauk SSSR. Mezhduvedomstvennyi geofizicheskii komitet. Poliarnye siianiia, 1970 No.19, p.5-11, In Russian. 29 refs.

A review is presented of studies on the VHF, SHF, and continuous VLF radio emissions of auroras and those occurring in the upper atmosphere in the auroral zone in the USSR and at the conjugate points Sogra-Kerguelen Is. The observations at these points showed that hiss, in contrast to chorus, starts and dies off simultaneously. Hiss in the subauroral zone is distinguished from hiss in the auroral zone by form and duration of noise, frequency range, diurnal and seasonal variations, and relation to auroras.

K-10031
Kodama, M. , Inoue, A.
MEAN MULTIPLICITY IN THE NM64 NEUTRON MONITOR AND ITS RELATION TO MODULATION SPECTRUM OF PRIMARY COSMIC RADIATION. Report ionsphere and space research in Japan, 1970 24(4), p.281-297, Tokyo
QC801.J3

Time variations of the mean neutron multiplicity m in the NM64 neutron monitor have been investigated using the data obtained at Showa Station, Antarctica since 1967, in order to find quantitative relations between m variations and modulation spectra of the primary cosmic radiation. The decrement of m from its average value was found to be from 0.008 to 0.016 on the hourly or 10-min basis, for four events of small solar cosmic ray increases observed on the ground level in 1967-1969. On the contrary, either no effects or enchancements of m were observed for some typical events of Forbush decreases. The reasonable modulation spectra and their time dependences for both events could be deduced from the observation values of m alone on the basis of theoretical calculations using the differential response or specific yield function for different multiple events.

K-10032
Ben'kova, N. , Bukin, G., Taieb, C., Walter, J.
EFFECTS OF AURORAL ELECTRON PRECIPITATION ON THE LOWER IONSPHERE DURING THE SUBSTORMS OF MARCH 24 AND 30, 1968. Effets sur la basse ionosphère de précipitations aurorales des electrons pendant les sous-orages des 24 et 30 mars 1968. Annales

de géophysique, July-Sept. 1970 26(3), p.671-674. In French.
QC801.A64

Ionospheric E and D region parameters were measured at the two magnetically conjugate points Kerguelen and Arkhangelsk during the two substorms of March 24 and 30, 1968. A comparison with simultaneous balloon measurements of RX produced by precipitating electrons in the auroral zone shows that ionospheric parameters are reliable for evaluating the energy of the electron spectrum. Variations of ionization in the lower ionosphere are found to be very sensitive to auroral electron precipitation in the 10-150KeV energy range. Variations of Fmin correlate well with counts of photons generated by secondary electrons due to precipitated electrons. The appearance of a dense and occulting Es "r" layer can serve, with a few simplifying hypotheses, to evaluate the spectrum of precipitated electrons. It is ordinarily assumed that l, f, c, or h type thin Es layers are of noncorpuscular origin. During substorms, however, their variability is related to electron precipitation even at subauroral latitudes.

K-10042
Ogura, K.
PRELIMINARY REPORT ON COSMIC RAYS AND BALLOON OBSERVATIONS BY THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1968-1970. Antarctic record, March 1971 No. 40, p.22-33, In Japanese with English summary. 6 refs.

The latitude dependence of cosmic-ray intensities was observed aboard the icebreaker Fuji along her route from Japan to Showa Station, in 1968-1969. This latitude survey was made for three components, i.e., cosmic-ray neutron, meson and total ionizing components. For a month from January 14, 1969, simultaneous balloon observations of the geomagnetic conjugacy of auroral X-rays were attempted at Showa Station and Keflavik, Iceland. Only three of ten Showa flights completely coincided in time with some of the Keflavik flights, so that the overlapping observation time was about 20 hours. Continuous observation of cosmic-ray neutron intensity was carried out using the 12-NM-64 neutron monitor. An unusual cosmic-ray increase was observed on February 25 and again on March 30, 1969. Another balloon observation was made by using a BF3 neutron counter in order to observe an altitude dependence of the low energy atmospheric neutron intensity at high latitudes. This report gives a brief summary of the above-mentioned observations and some preliminary results.

K-10043
Hayashi, K.
VLF EMISSION OBSERVED AT SYOWA STATION IN 1969-1970. A REPORT OF THE SECTIONS OF AURORA AND GEOMAGNETISM OF THE 10TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. Antarctic record, March 1971 No. 40, p.34-49, In Japanese with English summary. 11 refs.

This is a preliminary report on aurora and geomagnetism studies of the wintering party of the 10th Japanese Antarctic Research Expedition in 1969-1970. Among various observations carried out in these sections, VLF emission phenomena are described especially. The report deals with detailed dynamic spectra of polar chorus at the time of ssc's and si's and frequency variations of polar chorus in these events. Close relationship between low latitude magnetic micropulsations, pc-2 and pc-3, and modulated patterns of polar chorus dynamic spectrum is also shown. The early morning VLF emission phenomenon "auroral chorus" is defined in relation to magnetic micropulsations, pulsating aurorae, and negative geomagnetic bay events.

K-10044
Suzuki, Y.
OBSERVATION OF INFRASONIC WAVES AT SYOWA STATION IN 1979-1970. Antarctic record, March 1971 No. 40, p.50-51, In Japanese with English summary.

From 1969 to 1970, infrasonic waves were detected by a system of seven microphones placed in the vicinity of Showa Station on East Ongul Island, Antarctica. The period of these waves was usually 20 to 300 sec but occasionally waves with a period of more than 600 sec were recorded. The pressure ranged from 1 to 10 dynes/cm for waves with a period of 20 to 100 sec, and more than several tens of dynes/cm for waves of several hundred sec. The waves of 20 to 100 sec are correlated with the geomagnetic activity.

K-10045
Kondo, G.
OBSERVATIONS OF ATMOSPHERIC ELECTRICITY AT SYOWA STATION FROM FEBRUARY 1969 TO JANUARY 1970. Antarctic record, March 1971 No. 40, p.52-56, In Japanese with English summary.

As a part of the meteorological research program of the 10th Japanese Antarctic Research Expedition, observations of the atmospheric electric field and conductivity, and of the air-earth current near the surface at Showa Station were carried out continuously from February 1969 to January 1970, in concert with measurements of the vertical distribution of electric potential gradients by releasing special radiosondes. Annual mean values and diurnal variations of the electric field, conductivity and earth current are reported.

K-10048
Kawaguchi, S. , Hirasawa, T., Ito, H., Ashida, S., Ayukawa, M., Shirakabe, H.
REPORT OF THE ROCKET TEAM OF THE 11TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1970. Antarctic record, March 1971 No. 40, p.74-107, In Japanese with English summary. 9 refs.

On the 10th and 17th of February, 1970, two launchings of sounding rockets were made. The whole system is capable of launching the single-stage rocket, S-160JA type (length 3890 mm, diameter 160 mm, pay load 5.4 kg, max. altitude 88 km), s-210JA type (5210 mm, 210 mm, 12 kg, 120 km), S-300JA type (diameter 300 mm, max. altitude 160 km) and S-350JA type (diameter 350 mm). Observations indicate that the energetic electrons (or protons) with an energy of about 100 keV (or 1 MeV) penetrate down to the 70-90 km height in the polar ionosphere to enhance the D- and lower E-region ionization during the positive-bay event in the daytime. The ozone density decreases above 40 km. The ozone density profile in the polar region seems to be essentially similar to middle latitude profiles.

K-10050
Chmyrev, V.M. , Brunelli, B.E., Liatskii, V.B.
GEOMAGNETIC PULSATIONS AT HIGH LATITUDES. Geomagnitnye pul'satsii v vysokikh shirotakh. Geomagnitnye iavleniia v avroral'noi zone, Leningrad, Nauka, 1971, p.155-157, In Russian. 4 refs.

A comparison between geomagnetic pulsations which occurred under similar global conditions at Mirnyy during March-Dec. 1960 and at Lovozero during 11 scattered weeks in 1965 shows that the

range of pulsations during all the nights at both stations was the same; during the day the range at Mirnyy Station was higher, the longer the period of pulsation, the more noticeable. From this it is inferred that the nocturnal and short-period day-time fluctuations occur at latitudes between the stations, while daytime fluctuations occur at higher latitudes, apparently close to the line of force associated with the neutral point of the magnetosphere. The pulsation fluctuations of from 40 to 60 sec, as distinct from those of longer periods, were grouped approximately at local noon.

K-10058
Troitskaia, V.A. , Gendrin, R.
COLLOQUIUM ON FRANCO-SOVIET EXPERIMENTS AT CONJUGATE POINTS (BOROK, JULY 3-12, 1969). Colloque sur les experiences franco-sovietiques en points conjugues (Borok, 3-12 juillet 1969. Comite national francais des recherches antartiques. CNFRA, 1970 No.25, 90 p., In French. 33 refs.

Conjugate-point experiments involving several French and Soviet research institutions have been in progress since 1964. To assess the status of these studies a colloquium was arranged at Borok, USSR, on July 3-12, 1969. Results of the colloquium are reported in 3 parts: (1) Based on the papers presented, V.A. Troitskaia discusses the principal findings of the conjugate-point studies in the field of slow variations of the magnetic field, ionospheric phenomena, auroral brightness variations, auroral X-rays observed from balloons, VLF phenomena, rapid fluctuations of the magnetic field, etc. Causes and interactions of these phenomena are discussed in some detail. Particular attention is paid to the development of magnetospheric phenomena during substorms. (2) Summaries of 43 papers presented at the colloquium are given. (3) R. Gendrin outlines future directions of the cooperative experiments from the point of view of scientific objectives (studies of the plasmapause, substorms, energy exchange between solar wind and the magnetosphere, the electric field, neutral-atmosphere phenomena, and wave propagation), methods of experiment (expansion of the station network, comparison with satellite measurements and laboratory techniques), communication and organization.

K-10060
Kaneda, E. , Oguti, T., Nagata, T.
PHOTOGRAPHIC ATLAS OF AURORAL FORMS OBSERVED AT SYOWA STATION. Japanese Antarctic Research Expedition. Scientific reports, March 1968 A(4), 13 p., 10 refs.

Auroral forms observed at Showa Station, Antarctica, are compiled in the form of an atlas. A revised system of classification is used which relates auroral displays to physical mechanisms. Classification is conducted under the following headings; (1) Horizontal Extension, (2) Form of the Lower Border, (3) Homogeneity, (4) Vertical Profile, (5) Brightness, (6) Colour, (7) Activity and (8) Aspect.

K-10061
Kodama, M.
GEOMAGNETIC AND SOLAR MODULATION EFFECTS OF SEA-LEVEL COSMIC RAY INTENSITY. SUMMARY OF COSMIC RAY LATITUDE SURVEYS ABOARD THE EXPEDITION SHIP SOYA DURING 1956-1962. Japanese Antarctic Research Expedition. Scientific reports, Aug. 1968 A(5), 61 p., 81 refs.

Five latitude surveys for measurements of the cosmic ray nucleonic and meson components have been carried out aboard M/S Soya along a definite route between Japan and the Antarctic during 1956-1962. Using the data obatined from these surveys and also some other related data, investigations of the relationship between the cosmic ray intensity and the permanent magnetic field of the earth were performed, and the results are summarized in two parts. In part 1, it is shown theat the world-wide distribution of the cosmic ray neutron intensities at sea level is, in general, consistent with the spatial distribution of the vertical threshold rigidities determined from the trajectory calculations using a higher order simulation of the geomagnetic field. In part 2, it is found that the position of the latitude knee moves toward a higher rigidity as solar activity increases, from about 1 GV at the solar minimum to about 3 GV at the solar maximum, whereas the geographical position of the cosmic-ray equator remains constant.

K-10062
Kodama, M. , Inoue, A.
AVAILABILITY AND LIMITATION OF MULTIPLICITY MEASUREMENTS IN THE NM-64 NEUTRON MONITOR AT SYOWA STATION, ANTARCTICA. Japanese Antarctic Research Expedition. Scientific reports, Aug. 1970 A(9), 40 p., 33 refs.

Multiplicity measurements using the NM-64 neutron monitor have been carried out at Showa Station, and along a sea-level route between Japan and Showa Station. The barometric coefficient and the rigidity response function of the cosmic-ray neutron component are derived as functions of multiplicities from m = 1 to m > 6. The multiplicity spectrum is investigated in the cases of the cosmic modulation phenomena such as solar proton event, Forbush decrease and diurnal variation. It is shown that the barometric coefficients and the magnitudes of intensity variations as observed in the solar proton and Forbush decrease events are decreasing with increasing multiplicity, while no significant multiplicity effect is recognized in the diurnal variation. A possibility of distinguishing the various modulation spectra of the primary cosmic radiation on the basis of the multiplicity measurements is examined quantitatively. By taking into account the behavior of higher mutiplicities and the accuracy in low rigidity part of the differential response fundations, the limitation of the NM-64 neutron monitor in the multiplicity work is discussed.

K-10083
Nagata, T. , Oguti, T.
INTERRELATIONSHIP BETWEEN THE UPPER ATMOSPHERIC AND GEOMAGNETIC DISTURBANCES IN ANTARCTICA. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.66-95, 78 refs.
QC801.3.S6

Since the beginning of the IGY, systematic observations of upper atmospheric phenomena have been carried out fairly extensively in Antarctica. The relationships between conjugate points in the southern and the northern polar regions are reviewed using the concept of adiabatic invariance of charged particles trapped in the geomagnetic field. This relationship seems to be established for the configuration of the auroral maximal zone, the geomagnetic DS-field, geomagnetic bays, aurora, and geomagnetic giant pulsations. Topics discussed include the interrelationships between auroral luminosity, anomalous ionization of the E-region, and geomagnetic disturbances in the southern auroral zone; the apparent drift of aurora and the

associated geomagnetic variations; and spiral patterns of activity or occurrence frequency of auroral displays and geomagnetic and ionospheric disturbances found in the Antarctic.

K-10091
Tien, C.K.
STATISTICAL ES-LAYER RELATIONSHIPS AT CONJUGATE POINTS. Statisticheskie sviazi sloia Es v sopriazhennykh tochkakh. Geomagnetizm i aeronomiia, 1971 11(2), p.339-341, In Russian. Eng. transl. in: Geomagnet. Aeron., 11(2):285-286, Sept. 1971. 3 refs.

Observations on geophysical phenomena at conjugate points are given. Kerguelen-Sogra and Kerguelen-Dvina show that the actual frequency of occurrence of all types of Es is always higher than the probability of accidental coincidence. This indicates an interrelationship between the appearance of all types of Es at conjugate points. The results of the computed particle energies E and flux densities F for Sept. 8 and 23, 1966, show that the particle energies are almost the same in both hemispheres, while the flux densities fluctuate strongly, probably because of computation inaccuracy.

K-10092
Zhurii, I.G.
DETERMINATION OF THE LATITUDINAL RANGE OF MAGNETOMETER OPERATION DURING MEASUREMENTS OF GEOMAGNETIC FIELD COMPONENTS. Opredelenie shirotnoi zony raboty magnitometrov pri izmerenii sostavliaiushchikh magnitnogo polia Zemli. Geomagnetizm i aeronomiia, 1971 11(2), In Russian. Eng. transl. in: Geomagnet. Aeron, 11(2):316-318, Sept. 1971. 2 refs.

The magnitiude of error, which is the main criterion of magnetometer operation, was determined by the values of the components X, Y, H, and Z and related to the regions where measurements are made. The problems of determining the possible regions of operation of a component magnetometer are discussed. Graphs which represent the dependence of the maximum and minimum values of the components on geographic latitude, clearly show the difference in values of the magnetic field at the poles, its asymmetric distribution in the Northern and Southern Hemispheres, and the irregular latitudinal distribution of the isolines of the components. The graphic method for determining the values of the components has the great advantage of associating directly through latitudes all the components in any combinations for the real geomagnetic field. This permits determining the latitudinal possibilities of magnetometers and classifying them according to this criterion and not by measurement errors.

K-10093
Kleimenova, N.G. , Troitskaia, V.A.
SOVIET-FRENCH EXPERIMENT AT THE CONJUGATE POINTS SOGRA-KERGUELEN. Sovetsko-frantsuzskii eksperiment v sopriazhennykh tochkakh Sogra-Kergelen. Geofizicheskii biulleten', 1971 No. 22, p.3-10

French and Russian joint observations of variations of the geomagnetic field at the conjugate points in Sogra and Kerguelen Is. are reviewed. Data obtained during the last 5 years are given on: (1) "Pearl" type Pc-1 micropulsations; (2) IPDP micropulsations; (3) Pi-1 micropulsations (Sip flares); (4) Pc-3 and Pi-2 geomagnetic pulsations; and (5) VLF emissions. Information on various types of geomagnetic pulsations and VLF emissions can be used in studies of compound plasma processes, which occur at great distances around the Earth.

K-10109
Kleimenova, N.G.
ON THE ASSOCIATION OF EARLY-MORNING ULF ELECTROMAGNETIC RADIATIONS (DAWN CHORUS AND HISSING NOISE) WITH MAGNETIC BAYS AND WITH THE STATE OF THE HIGH-LATITUDE IONOSPHERE. O sviazi utrennikh elektromagnitnykh izluchenii UNCh-diapazona (khorov i shipenii) s magnitnymi bukhtami i sostoianiem ionosfery vysokikh shirot. Akademiia nauk SSSR. Izvestiia. Fizika zemli, 1967 No. 3, p.74-76, In Russian. 7 refs. English translation in its Izvestiya. Physics of the solid Earth, No. 3:189-190, Aug. 1967
QC801.A357

An attempt was made to find a relationship between VLF emissions in the 0.6-12 kHz range at the conjugate points Sogra-Kerguelen and anomalous absorption in the high-latitude ionosphere and negative bays in the magnetic field. The results show that most of the VLF bursts occur simultaneously with the bays. Anomalous absorption in the ionosphere and the VLF burst start either practically simultaneously, or the burst lags slightly behind. A relationship was found also between VLF and riometer data of absorption in the auroral zone in the early-morning hours. It was concluded that all geophysical phenomena described are probably of the same origin and, in particular, that early-morning VLF is directly connected with the invasion of the high-latitude ionosphere by streams of electrons with an energy of several tens of keV.

K-10110
Gokhberg, M. , Gendrin, R., Lacourly, S., Malevskaia, O., Troitskaia, V.A.
POLARIZATION OF THE PC-1 TYPE (THE PEARLS) OF HYDROMAGNETIC OSCILLATIONS AT MAGNETICALLY CONJUGATE POINTS: SOGRA, USSR AND KERGUELEN, FRANCE. Poliarizatsiia gidromagnitnykh kolebanii tipa Pc-1 (zhemchuzhiny) v magnitno sopriazhennykh tochkakh Sogra (SSSR) - Kerguelen (Frantsiia). Akaemiia nauk SSSR. Doklady, May 21, 1967 174(3), p.576-579, In Russian. 12 refs. English translation in Akademiia nauk SSSR. Doklady. Earth science, 174(1-6):7-10, Dec. 1967
QE1.A25183

An analysis of data obtained at the Sogra and Kerguelen conjugate points from Feb. 18 to March 9. 1965, shows that Pc-1 fluctuations are propagated from one hemisphere into the other, retaining a certain polarization, either left or right, intrinsic to a given series. When several similar series, but with different frequencies at the conjugate points, are superimposed, the polarization may be either the same or opposite; this shows that simultaneous propagation along the line of force of both left- and right-polarization is possible. Contrary to theoretical expectations, the fluctuations display elliptical rather than circular polarization, with the long axes of the polarization ellipses elongated in a N.-S. direction.

K-10111
Gokhberg, M. , Gendrin, R., Lacourly, S., Troitskaia, V.A., Shchepetnov, R.
SIMULTANEOUS APPEARANCE OF PC-1 MICROPULSATION BURSTS AT CONJUGATE POINTS. Odnovremennoe vozniknovenie v sopriazhennykh tochkakh vspleskov mikropul'satsii klassa Pc-1. Akademiia nauk SSSR. Doklady, June 1, 1967 174(4), p.828-829.

In Russian. 10 refs. English translation in Akademiia nauk SSSR. Doklady. Earth science, 174(1-6):13-15, Dec. 1967
QE1.A25183
Results of measurements at Sogra and Kerguelen Is. from Feb. 1964 to Feb. 1965 suggest that the nature of excitation of bursts of Pc-1 fluctuations in the magnetosphere differs for period-decaying oscillations and for Pc-1 series. In the former there evidently is simultaneous excitation of two hydromagnetic waves of different mode which propagate in opposite directions. In the case of structured Pc-1 series, hydromagnetic waves of one particular mode are generated which then propagate from one hemisphere to the other along the lines of force.

K-10118
Kleimenova, N.G. , Troitskaia, V.A., Gendrin, R., Ponsot, C., Vigneron, J.
ULTRA LOW FREQUENCY RADIATION OBSERVATIONS AT TWO CONJUGATE POINTS. Natliudeniia ul'tranizkochastotnogo izlucheniia v dvukh sopriazhennykh tochkakh. Akademiia nauk SSSR. Doklady, 1966 170(4), p.835-836, In Russian. 4 refs. English translation in Akademiia nauk SSSR. Doklady. Earth science, 170(1/6):27-29, Apr. 1967
QE1.A25183
Results of VLF emission measurements at the Sogra and Kerguelen conjugate points from July 1964 to March 1965 indicate that chorus is rarely observed simultaneously at the two stations, and it precedes only negative ionospheric storms. Positive ionospheric storms are accompanied neither by chorus nor by whistlers. Unlike chorus, hiss generally starts and ends at the same time at conjugate points. No VLF emissions occur during magnetically undisturbed periods, when the outer boundary of the magnetosphere is situated at a distance of about 10 earth radii in the exosphere.

K-10120
Garcia, E.O.
SPIRALS OF PRECIPITATION AND AZIMUTHS OF AURORAL ARCS. Espirales de precipitación y acimutes de arcos aurorales. Buenos Aires. Instituto Antártico Argentino. Contribución, 1971 No. 89, 27p., In Spanish with English, French, German, and Italian summaries. 5 refs.
On the basis of visual observations of southern auroras at Ellsworth Station during 1962 it was possible to discern 1,840 occurrences of homogeneous arcs suitable for determining the daily latitudinal shift; 1,897 occurrences of homogeneous arcs were available for determining the movement of the mean values of the azimuths of their vertices. These observational curves were compared with theoretical curves from models postulated by Stormer (1955) and Alfven (1950), for the precipitation of charged particles in the Earth's upper atmosphere. Good agreement is found between observed vertices and those derived from Alfven's theory. (Auth. mod.)

K-10128
Ben'kova, N.P. , Bukin, G.V., Walter, J., Taieb, C.
DISTURBANCES IN THE LOWER IONOSPHERE AND THE PRECIPITATION OF AURORAL PARTICLES DURING THE SUBSTORMS OF MARCH 24 AND 30, 1968. Vozmushcheniia v nizhnei ionosfere i vysypanie avroral'nykh chastits vo vremia subbur' 24 i 30.III 1968 g. Kosmicheskie issledovaniia, Mar.-Apr. 1971 9(2), p.300-304, In Russian. 4 refs. English translation in Cosmic research, 9(2): 274-278, Oct. 1971
QB500.K63
For a French version and abstract see K-10032.

K-10131
Ben'kova, N. , Bukin, G., Kerbali, T., Davoust, C., Taieb, C.
SYNOPTIC OBSERVATIONS OF THE F2 LAYER AT THE MAGNETICALLY CONJUGATE REGIONS KERGUELEN AND ARCHANGEL. Les observations synoptiques de la couche F2 dans des régions magnétiquement conjuguées de Kerguelen et Arkangelsk. Annales de géophysique, Jan.-Mar. 1969 25(1), p.67-71, In French with English summary. 4 refs.
QC801.A64
Simultaneous ionospheric observations in the two conjugate regions of Archangel and Kerguelen in 1965 and 1966 are studied. Differences between foF2 and monthly median of foF2 are compared for three pairs of stations. Two types of correlation are obtained: 1. The variations of differences are in phase in both hemispheres when magnetism and ionosphere are disturbed; 2. The variations of differences are in antiphase when the magnetic activity is low. During quiet periods no correlation is visible. (Auth.)

K-10171
Domingo, V. , Page, D.E.
NORTH-SOUTH ASYMMETRY OF SOLAR-PARTICLE FLUXES IN POLAR-CAP REGIONS. Journal of geophysical research, Dec. 1, 1971 76(34), p.8159-8164, 22 refs.
QC811.J6
On Jan. 24, 1969, an experiment on the Esro 1/Aurorae satellite recorded a flux over the central North Pole that at times was a factor of 7 greater than that seen over the South Pole. This asymmetry is discussed in relation to the interplanetary-field direction measured at the same time by the Heos spacecraft, and comparison is made with the opposite asymmetrical configuration observed by Evans and Stone (1969) on November 2, 1967 (K-7177). From the evidence of two events it would appear that a southward interplanetary field plays a significant role in permitting direct access, while the magnitude and polarity of the asymmetry are determined by, respectively, interplanetary-particle anisotropy and the 'toward' or 'away' nature of the field. (Auth.)

K-10172
Hones, E.W., Jr. , Akasofu, S., Bame, S.J., Singer, S.
POLEWARD EXPANSION OF THE AURORAL OVAL AND ASSOCIATED PHENOMENA IN THE MAGNETOTAIL DURING AURORAL SUBSTORMS, 2. Journal of geophysical research, Dec. 1, 1971 76(34), p.8241-8257, 13 refs.
QC811.J6
The process of plasma-sheet thinning is examined in substorms for which all-sky photographs as well as ground-based magnetograms were available. Thus the thinning process could be correlated with features of both the auroral substorm and the polar magnetic substorm. The following phenomena usually begin simultaneously to within the few minutes accuracy of the timing of the measurements: (1) plasma-sheet thinning, (b) development of negative magnetic bays in the nightside auroral oval (independent of whether these develop rapidly or gradually), (c) development of positive magnetic bays at nightside low-latitude stations, and (d) brightening and poleward motion of auroras in the

nightside auroral oval. During the substorm a set of high-quality all-sky potographs obtained at Showa Station showed that a quiet arc located near the equatorward horizon of Showa Station became suddenly bright at 22h 39m 30s UT and began to move violently poleward. The 30-MHz riometer at Showa began to indicate enhanced radio noise absorption beginning at 2240 UT, and the absorption reached a peak value of approx 1 db between 2242 and 2243 UT as the poleward edge of the auroral luminosity passed through the zenith of the station. Active auroras covered almost the whole sky over Showa by 2249 UT. The aurora brightened somewhat near the poleward horizon at about 2250 UT. At 2300 UT, auroras reached nearly to the poleward horizon. (Auth. mod.)

K-10173
Ballif, J.R. , Jones, D.E., Skousen, E.N., Smith, D.T.
COSMIC-RAY DECREASES AND THE OCCURRENCE OF SOLAR FLARES. Journal of geophysical research, Dec. 1, 1971 76(34), p.8401-8408, 8 refs.
QC811.J6

Mechanisms proposed to account for observed relationships between the occurrence of solar flares and cosmic-ray decreases at the Earth are examined by using a large fraction of all existing standardized flare data obtained from a continuously monitored sun. The interval studied extended from July 1957 through July 1968 and cosmic-ray data used were from Resolute Bay, Thule, Churchill, Mawson, and Wilkes Stations. A total of 76 cosmic-ray decreases were identified during this interval. By using epoch analysis as well as inspection of the original data, it is found that active flare-producing regions crossed central meridian just before the cosmic-ray decreases began. It was also found that a broad maximum in class 2 or greater flares occurred just before the decreases occurred. However, the flares forming this maximum were observed on the eastern part of the solar disk. Epoch analysis of decreases with greater amplitude show the same relationships to the occurrence of flares. Even the most intense decreases that were thought to be the result of specific known flares show a direct relationship to the time of central-meridian passage of active flare-producing regions. It was concluded that all large cosmic-ray decreases are associated with flare-producing regions. (Auth. mod.)

K-10174
Bell, T.F. , Helliwell, R.A.
PULSATION PHENOMENA OBSERVED IN LONG-DURATION VLF WHISTLER-MODE SIGNALS. Journal of geophysical research, Dec. 1, 1971 76(34), p.8414-8419, 11 refs.
QC811.J6

Whistler-mode signals from station NAA (14.7 and 17.8 kHz), Cutler, Maine, show periodic fluctuations ('pulsations') in amplitude and bandwidth. The data were recorded at Eights station, Antarctica, from 1963 to 1965 during unmodulated ('key-down') transmissions from NAA lasting up to 2 min. In three of the four instances, the pulsations consist of a series of moderate enhancements of the amplitude and bandwidth of the signal, each pulsation lasting about 50 msec. The fourth instance, however, was unusual in that the key-down signal exhibited remarkably regular and intense amplitude variations. In all four occurrences, the period of the pulsation was in the range from 0.3 to 0.6 sec. In three occurrences, this period was roughly the same as the one-hop whistler-mode delay along the fieldline path; however, no demonstrable mechanism to explain this association could be found. An explanation of pulsations in terms of multipath fading effects could not be supported by the data. More likely explanations include intrinsic oscillation in the emission generation mechanism, natural oscillation in the energetic-particle population, or modulation of the VLF growth rate by Pc 1 micropulsations in the region of wave growth.

K-10175
Rosenberg, T.J. , Helliwell, R.A., Katsufrakis, J.P.
ELECTRON PRECIPITATION ASSOCIATED WITH DISCRETE VERY-LOW-FREQUENCY EMISSIONS. Journal of geophysical research, Dec. 1, 1971 76(34), p.8445-8452, 21 refs.
QC811.J6

Preliminary results of a wave-particle experiment conducted near the plasmapause at Siple Station on Jan. 2, 1971 are reported. Balloon-borne data on bremsstrahlung X rays, arising from the precipitation of energetic electrons, and VLF emissions were recorded with sodium iodide scintillation counters and with VLF receivers at Siple and Byrd Stations and their conjugates at Roberval, Quebec, and Great Whale River, respectively. During a period of enhanced activity at Siple Station a one-to-one correlation was found between short bursts of X rays (E>30 kev) and bursts of VLF emissions with center frequency near 2.5 kHz. These observations are interpreted in terms of the cyclotron resonance interaction at the equator, and suggestions are made for further experiments.

K-10193
Peden, I.C. , Rogers, J.C.
EXPERIMENT FOR DETERMINING THE VLF PERMITTIVITY OF DEEP ANTARCTIC ICE. IEEE transactions on geoscience electronics, Oct. 1971 GE-9(4), p.224-233, 24 refs.
QC801.I2

An experiment that has been designed to yield the dielectric and loss properties of the ice cap near Byrd Station in the very-low-frequency range, subsequent to proper interpretation of the input admittance of an electrically short dipole probe, is described. The probe is lowered into a deep drill hole, together with appropriate measuring and telemetering equipment, in order that the parameters of interest may be recorded as functions of vertical depth and frequency. The motivation for such an experiment is discussed and the environmental conditions described, insofar as they restrict the kinds of experimental procedures that can be carried out with reasonable safety and economy. The measurement technique itself is outlined, together with some background material concerning the use of a dipole antenna as a probe for exploring the properties of the medium in which it is immersed. Also discussed is a related experiment performed to provide a check on the method. It involved the use of the same probe and instrumentation to measure the complex permittivity of sawdust, a lossy dielectric material. The results are shown to be in good agreement with those obtained by a more conventional laboratory method.

K-10229
Kakinuma, S. , Oguti, T., Kokubun, S.
LATITUDINAL SURVEY OF VLF EMISSIONS DURING THE JARE SOUTH POLE TRAVERSE 1968-69. Japanese Antarctic Research Expedition. Scientific

reports, March 1971, Special issue No.2, p.183-187. 8 refs.

Various devices for recording spectral characteristics and intensity variation in VLF emissions have been operated, and measurements of polarization and arrival direction of VLF waves have been carried out. The direction of observation is a useful method for examining the spatial characteristics of VLF emissions, and observations at separated positions are most useful for clarifying the spatial dependence. Thus, the main purpose of the observations was the recording of polar chorus emissions, because hiss is observed mostly in winter. The traverse covered the latitude ranges between 69 and 80 deg in geomagnetic coordinates, in which the statistical polar chorus zone is included.

K-10240
Driatskii, V.M. , Krupitskaia, T.M., Shirochkov, A.V.
ENERGY SPECTRUM OF SOLAR COSMIC RAYS AND POLAR CAP ABSORPTION. Energeticheskii spektr solnechnykh kosmicheskikh luchei i pogloshchenie tipa poliarnoi shapki. Geomagnetizm i aeromoniia, p.429-434, In Russian. Eng. transl. in: Geomag. Aeron, 11(3), Nov. 1971. 13 refs.

The polar cap absorption event of May 24-25, 1967, is described on the basis of riometer data from the Arctic Heiss I. and Antarctic Vostok Station. Data on solar cosmic-ray fluxes, which were recorded by Explorer 34 and were responsible for the formation of an ionized region in the lower ionosphere in this period, are analyzed. A comparison of these data leads to the conclusion that this PCA event was produced by protons with E > 10 MEV during the daytime and protons with E = 5-10 MEV at night.

K-10241
Starkov, G.V. , Fel'dshtein, IA.I.
SUBSTORM IN AURORAS. Subburia v poliarnykh siianiiakh. Geomagnetizm i aeronomiia, Nov. 1971 11(3), p.560-562, In Russian. Eng. transl. in: Geomag. Aeron, 11(3), Nov. 1971. 16 refs.

Additions to the generally accepted pattern of development of an auroral substorm for supplementing Akasofu's proposed pattern are noted as follows: (1) A substorm develops in three phases: incipient, developmental, and recovery. The instant T = 0 in former patterns corresponds to the beginning of the developmental phase. During the incipient phase auroral arcs move from 70 deg to 65-67 deg; (2) discrete auroras of the polar cap type disappear 10-30 min before the instant T = 0; (3) the auroral band that moves toward the pole during the developmental phase leaves a considerable emission background after it; and (4) in addition to discrete forms, diffuse emission is observed in the polar region. These phase developments are the result of analyzing all-sky films of auroral substorms at Vostok Station.

K-10242
Afonina, R.G. , Fel'dshtein, IA.I.
RELATIONSHIP BETWEEN GEOMAGNETIC FIELD VARIATIONS IN THE POLAR REGION AND IN THE MORNING-NIGHT SECTORS OF THE AURORAL OVAL. O sviazi variatsii geomagnitnogo polia v pripoliusnoi oblasti i v utrenne-nochnom sektorakh avroral'nogo ovala. Geomagnetizm i aeronomiia, Nov. 1971 11(3), p.567-570, In Russian. Eng. transl. in: Geomag. Aeron, 11(3), Nov. 1971. 13 refs.

Studies of the relationship between geomagnetic field variations in the polar region and in the morning-night sectors of the auroral oval show the superposing of two waves on variations of disturbed days in both seasons, one (auroral zone modulation) with a maximum at 13 to 17 h and a minimum at 3 to 6 h produced by the western electrojet field, and the other (polar type modulation), which changes phase from winter to summer and reaches a maximum and minimum, respectively, at 14 h. The two types of modulation are discussed in terms of: (1) main direction of the current in the polar region from the evening to the morning side, and the presence of a westerly current in the morning associated with currents in the polar region; (2) diurnal and seasonal variations of current intensity on international quiet and disturbed days.

K-10243
Potemra, T.A. , Lanzerotti, L.J.
EQUATORIAL AND PRECIPITATING SOLAR PROTONS IN THE MAGNETOSPHERE. 2. RIOMETER OBSERVATIONS.. Journal of geophysical research, Aug. 1971 76(22), p.5244-5251, 29 refs.

The equatorial solar protons measured on ATS 1 during the Jan. 28, 1967, solar event are used together with the ionosphere model of Potemra et al. (1969) to calculate the expected daytime 30-MHz riometer absorption. The computed absorption values compare favorably with the riometer observations at Byrd, Antarctica, located on approximately the same L shell (L = 7) as ATS 1 (L = 6.4). The latitude profiles measured by the polar-orbiting satellite 1963-38C show that during the decay of the event Byrd was within a latitude region where fewer protons precipitated in comparison to higher latitudes. The absorption measured at Byrd during this period was systematically lower than the absorption measured at either South Pole (L = 13) or McMurdo (L = 32) stations well within the polar cap. Absorption values computed from the 1963-38C proton fluxes at the latitude of Byrd compare favorably with the observed absorption at this station.

K-10244
Lanzerotti, L.J.
EQUATORIAL AND PRECIPITATING SOLAR PROTONS IN THE MAGNETOSPHERE. 1. LOW-ENERGY DIURNAL VARIATIONS. Journal of geophysical research, Aug. 1971 76(22), p.5235-5243, 28 refs.

Recent experimental determinations of the total proton gamma -ray production measured by the balloonborne NaI (Tl) scintillation counter at Byrd Station are used together with equatorial proton fluxes measured on ATS 1 to calculate the predicted diurnal variations in the precipitating low energy solar proton-produced gamma -rays. Resonable agreement is obtained in the relative diurnal variations for observations separated 2 hours in local time and on approximately the same L shell. However, the predicted gamma -ray fluxes, using the equatorial data, are approximately 10 times less than those actually measured.

K-10250
Manno, V. ed , Page, D.E. ed
INTERCORRELATED SATELLITE OBSERVATIONS RELATED TO SOLAR EVENTS. PROCEEDINGS OF THE THIRD ESLAB/ESRIN SYMPOSIUM HELD IN NOORDWIJK, THE NETHERLANDS, SEPTEMBER 16-19, 1969. Dordrecht, Netherlands, D. Reidel, 1970. 627p., Refs.
QB524.I57

The 1969 ESLAB/ESRIN Symposium held during Sept. 16-19, 1969 at Noordwijk, the Netherlands deals with the subject matter related to solar-terrestrial relations and intercorrelated

satellite observations. To accomplish this correlation one single solar event, that of Feb. 25, 1969 was chosen around which the observations are centered, that were obtained by 3 satellites, ESRO I and II and HEOS A, operating at the same time. The papers presented are grouped in the following sections: Solar Particles and Electromagnetic Radiation; Solar Wind Variations During and After Solar Events; Bow Shock Variations Following Solar Events; The Magnetosphere During and After Solar Events; The Magnetotail; Some Ionosphere Effects Following Solar Events; and Satellite and Rocket Results for the Feb. 25, 1969 Event. For abstracts of selected papers see K-10251 to K-10258.

K-10251
Smart, D.F. , Shea, M.A.
PROPOSED SOLAR PROTON EVENT CLASSIFICATION SYSTEM. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.102-107, 6 refs.
QB524.I57

A proposed classification system is based on the logarithm (base 10) of the solar proton flux in units per sq cm/sec/ster. A reference level of 10 MeV was recommended by members of the Inter-Union Commission on Solar-Terrestrial Physics (IUCSTP). Basically each solar proton event would be classified by a three digit number; the first digit representing neutron monitor response, the second representing riometer response and the third describing the proton intensity with E > 10 MeV. Since the main concern with these events is the way they affect the earth, this three digit number is confined to the response of earth-based sensors and satellites in an earth-moon system orbit. Riometer and neutron monitor locations acceptable for this classification system include: Vostok, McMurdo, South Pole, Cape Hallett, Dumont Durville, Ellsworth, Mawson, Mirnyy, and Showa Stations in Antarctica.

K-10252
Paulikas, G.A. , Blake, J.B., Vampola, A.L.
SOLAR PARTICLE OBSERVATIONS OVER THE POLAR CAPS. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.193-204, 15 refs.
QB524.I57

This paper summarizes recent measurements of spatial (latitude) distributions and angular distributions of low energy solar particles over the polar caps. Of special interest, because of their small gyroradii, are solar protons and alpha particles with energies less than 10 MeV/nucleon. Solar electrons of 40 keV provide an additional means for studying access of solar particles to the caps. Solar proton and electron data are compared and the connection between the limits of trapping and the access and cutoff latitudes for solar particles is discussed. It is concluded that some scattering of low energy solar protons, but not necessarily of electrons, is required in order to account for the experimental observations of solar particles over the polar caps. Direct entry of particles through the flanks of the magnetosphere appears to play a role in supplying particles to the caps.

K-10253
Bostrom, C.O.
ENTRY OF LOW ENERGY SOLAR PROTONS INTO THE MAGNETOSPHERE. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.229-237, 28 refs.
QB524.I57

Some aspects of the temporal and spatial variations of low energy solar protons are examined by comparing data from the polar orbiting satellite 1963 38C with measurements in interplanetary space by Explorers 33 and 34. Selected periods during the events of September 1966 and May 1967 are used to show a variety of features in the polar region latitude profiles. The proton intensity in the low latitude 'rim' of the polar region appears to track the interplanetary flux of solar protons more readily than does the polar intensity. The rim straddles the energetic electron trapping boundary, and the rim intensity is frequently greater than the polar plateau flux. The inter-satellite comparisons and latitude profiles are discussed in terms of model requirements. (Auth.)

K-10254
Volk, H. , Haerendel, G.
MAGNETOSPHERIC ELECTRIC FIELDS. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.280-296, 45 refs.
QB524.I57

This article discusses observational results in the magnetosphere at high latitudes. The problem of mapping ionospheric fields in the magnetosphere is briefly discussed. Some recent electrostatic probe measurements with sounding rockets are reported, showing auroral display phenomena. Probes flown on satellites show the onset of an intense irregularity structure poleward from the auroral zones and evidence of the plasmapause. Extensive ground-based studies examined whistlers detected in plasma position changes presumably due to the convective action of electric fields. Low-energy ion flux anisotropies have been detected, using retarding potential analyzers, in satellite observations. A balloon experiment using electrostatic probes in the auroral zone is reviewed and related to a synoptic view of the local electric field distribution for an entire day. Measurements of ion clouds, the results of barium experiments in the auroral ionosphere are discussed, and a first ion cloud experiment in the distant magnetosphere by the ESRO satellite HEOS I is described.

K-10255
Reid, G.C.
CURRENT PROBLEMS IN POLAR CAP ABSORPTION. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.319-334, 35 refs.
QB524.I57

This paper outlines some of the more important features of PCA, describes a few areas in which knowledge is inadequate, and comments on ways in which coordinated satellite and ground-based observations can contribute. There is need for a satellite experiment that consciously uses the excellent potential of the riometer as a

synoptic monitoring tool to aid in the identification of periods of special interests. Rocket experiments capable of measuring ion concentrations, as well as electron density, would be fruitful for measuring electron-density profiles in PCA conditions. Alternative approaches, such as the use of partial-reflection observations to measure the electron-density profile should be exploited. The general problem of the interaction of energetic solar particles with the earth's environment may be solved by a combination of techniques.

K-10256
Zhulin, I.A.
INTERDISCIPLINARY INVESTIGATIONS OF THE AURORAL PHENOMENA. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.335-340, 6 refs.
QB524.I57

Problems and difficulties of the interdisciplinary analysis of auroral phenomena are discussed in the Soviet-French cooperative efforts of March-April 1968, in which a series of balloons were launched in the northern (Arkhangelsk region) and southern (Kerguelen Island) conjugate subauroral zones (L = 3.85). During this experiment a better conjugacy was achieved than during all the other known flights of balloons (approximately 50 km). Based on Roederer's calculations the forces influencing conjugacy are estimated in terms of the daily migration of conjugate points due to the change of spatial position of the geomagnetic-field axis. On the 1st of April, 1968, three events of auroral-electron precipitation were recorded. In the energetic spectrum of these electrons the presence of soft and hard components was revealed (characteristic energies 6 and 30 keV). In one of the events the presence of the maximum in the exponential spectrum near 90 keV (nearly monoenergetic flux of electrons) was revealed. Possibilities for the intercorrelated analysis of obtained data in comparison with satellite data (especially from ESRO-1) are discussed. (Auth. mod.)

K-10257
Davis, T.N.
ASPECTS OF AURORAL MORPHOLOGY. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.341-349, 32 refs.
QB524.I57

The temporal relationship of the auroral substorm to increases in the total particle kinetic energy within the trapping region and also the characteristics of auroras near the equatorward boundary of the typical display indicate a close physical connection between acceleration processes causing auroras and growth of the ring current. Conjugate studies of auroras during disturbed epochs indicate sizable distortions in the geomagnetic field at the higher latitudes; these distortions may be caused by meridional asymmetry in the ring current as well as by magnetopause and neutral sheet currents. (Auth.)

K-10258
Raitt, W.J.
IONOSPHERIC MEASUREMENTS BY THE ESRO-1 SATELLITE DURING THE FEBRUARY 25TH 1969 SOLAR PROTON EVENT. V. Manno and D.E. Page (eds.), Intercorrelated Satellite Observations Related to Solar Events. Proceedings of the 3d ESLAB/ESRIN Symposium held in Noordwijk, Netherlands, Sept. 16-19, 1969, Dordrecht, Netherlands, D. Reidel, 1970, p.535-548, 3 refs.
QB524.I57

A study of isolated groups of ionospheric data measured in the altitude range 300-1300 km over all geomagnetic latitudes has shown no obvious, large scale effects of the type of solar proton event which occurred on February 25th 1969. It might be expected that energetic particle effects at these altitudes would be masked by solar ionization since during the period under discussion the orbit of ESRO-I was fully sunlit. However, it is difficult to explain the rapid fluctuations in temperatures and densities in the polar region without resorting to a particle source of ionization. The data analysis is as yet in an early stage, but it would seem that a better understanding of the interactions of the disturbed particle flux over the polar regions and the high altitude ionosphere will have to wait for either a statistical study of a number of solar proton events or more collaboration between the individual ESRO-I experimenters. (Auth.)

K-10273
Davis, T.N. , Echols, C., Wong, Y.S.
HOURLY VALUES OF THE AURORAL ELECTROJET ACTIVITY INDEX AE FOR JULY-DECEMBER 1957. Alaska. University. Geophysical Institute. Scientific report, March 1968 UAGR-194, 48p., N68-35040/44, N68-34810/12, Also: 1958, UAG-R-192, 77p. July 1967; 1959, UAG-R-195, 84p. Oct. 1967; 1960, UAG-R-199, 84p. March 1968; 1961, UAG-R-196, 84p. Oct. 1967; 1962, UAG-R-197, 84p. Oct. 1967; 1963, UAG-R-200, 84p. March 1968; 1964, UAG-R-198, 84p. Sept. 1967.

This series of reports contains plots and tables of hourly-average values of the auroral electrojet index (AE index) for the period July 1957 through the year 1964. The method by which the AE index is derived is described by Davis and Sugiura (1966) (See: K-3519). The basic data used are instantaneous or time-averaged readings of the H trace in the standard magnetograms from 11 observatories, of which two are Halley Bay and Byrd Stations, distributed around auroral zones. The readings are referenced to a level determined for each observatory from quiet intervals. All the data from the auroral-zone observatories are plotted against UT and two envelopes are drawn to embrace all the points. The AE index at any epoch is defined by the distance (for separation) between the upper (AU) and lower (AL) envelopes at that epoch.

K-10276
Fel'dshtein, IA.I. , Zaitsev, A.N.
MAGNETIC FIELD VARIATIONS AT HIGH LATITUDES ON QUIET DAYS IN SUMMER DURING THE IGY. Variatsii magnitnogo polia v vysokikh shirotakh po spokoinym dniam leta MGG. Geomagnetizm i aeronomiia, 1967 7(1), p.204-206, In Russian. Eng. transl. in: Geomag. Aeron., 7(1), Sept. 1967, 8 refs.

On the basis of geomagnetic data from the Arctic and Antarctic obtained during the Second International Polar Year and the IGY, the space-time distribution of the disturbance vector in the horizontal plane and Z isolines for the IGY summer is discussed. A comparison of the distributions on quiet and disturbed days during the IGY summer leads to the conclusion that the

disturbance field always represents the sum of SD and SqP in summer. The SqP variation predominates on quiet days and SD predominates on disturbed days, and SD and SqP are evidently the result of the effect of solar corpuscular radiation on the polar ionosphere.

K-10338
Pomerantz, M.A. , Duggal, S.P.
COSMIC RAY INTENSITY VARIATIONS IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 219-221, 3 refs.

Continuous measurements of the cosmic ray intensity at the Bartol network of stations in the Antarctic (McMurdo and South Pole) and the Arctic (Thule) during the first solar maximum period (Jan. 1967 to Mar. 1971) have revealed two important discoveries in connection with the transient north-south asymmetry of galactic cosmic rays. In the initial case the duration of the anisotropy was only a few hours. However, north-south asymmetry can persist for as long as 6 days, a period equal to the extent of an interplanetary magnetic sector. In contrast, the second new type of event provides insight into the dynamics of the morphology of the interplanetary medium. The phase of the axial asymmetry during this cosmic ray storm reversed its direction twice in less than 36 hr. With respect to the propagation of solar cosmic rays, an abnormal anisotropy during a solar particle event, manifesting itself as a 49 percent difference in the nucleonic intensity at the north and the south polar stations, was observed for the first time.

K-10339
Helliwell, R.A.
WHISTLERS CHANGE VLF SIGNAL AMPLITUDES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 221

As part of a continuing study of the magnetosphere, the field strength of the very low frequency signals of several transmitters has been recorded continuously at Eights Station (1963 and 1965) and Byrd Station (1963-1970). During equinoctial periods, many amplitude anomalies were observed on the VLF signals, whose paths were all subionospheric. Study of approx 200 events has revealed that a whistler was present at the exact time the VLF signal amplitude began to change. Characteristics of the events are given. The correlation between VLF signal intensity anomalies and absorption suggests that the two are a result of electron precipitation, and that, in fact, the electron precipitation is caused by whistlers. The results indicate that the continuous monitoring of VLF signals can be used to monitor electron precipitation.

K-10340
Masley, A.J. , Satterblom, P.R.
SOLAR COSMIC RAY EVENTS, 1969 AND 1970. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 221-223

During 1970, 14 solar cosmic ray events were observed with riometer absorption greater than 0.4 dB at 30 MHz. This number compares to 21 events during 1969, 20 during 1968, and 16 during 1967. The four largest events were between 3 and 4 dB. The polar-orbiting OGO-6 satellite was launched on June 5, 1969. The two largest events in 1969 observed simultaneously by the McDonnell Douglas OGO-6 and ground-based polar equipment occurred on Sept. 25 and Nov. 2, 1969. These two events are described.

K-10341
Akasofu, S.-I.
AURORAS OVER THE SOUTH POLE AND INTERPLANETARY MAGNETIC FIELD CHANGES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 223-224

The South Pole station has provided the first opportunity to make a detailed study of the responses of auroras to changes in interplanetary magnetic fields. An example is shown of the sudden activation of an aurora over the South Pole which was associated with the turning of the interplanetary magnetic field vectors from the northward to the southward direction. The auroras were suddenly activated at about the time of the turning after a prolonged period of northward-directed interplanetary field during which auroras were quiescent and very faint. Also shown is the simultaneous magnetic sector during the event. There appears to be a significant delay in the onset of magnetic bays after the moment of turning of the interplanetary field vectors.

K-10342
Millman, P.M.
CONJUGATE-POINT AURORAL STUDIES AT BYRD AND GREAT WHALE STATIONS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 224-225, 1 ref.

Primarily, this program involves the use of auroral all-sky cameras and photometers at Byrd Station in the Antarctic and at the Great Whale Geophysical Station in the Canadian Subarctic. During the austral winter of 1970 identical auroral photometers were operated at the two stations. Relative intensity measurements of auroral emissions at 5,577 angstroms (OI "green" line), 4,861 angstroms (H beta), and 3,914 angstroms (N2 + First Negative System 0,0 band) were made continuously during the dark hours at each station. Equipment problems, mainly at Byrd, limited the quanitity of usable data to about half the maximum possible. Data from the operation of all-sky cameras at both stations was also reduced by difficulties. Various forms of photometer stations have been tested in the neighborhood of Great Whale Station.

K-10343
Stenbaek-Nielsen, H.C. , Wescott, E.M., Peterson, R.W.
AIRBORNE CONJUGATE AURORAL STUDIES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 225-226, 3 refs.

On the basis of all-sky camera data obtained on three flights in Mar. 1967, it was demonstrated that auroras observed during period of low geomagnetic activity are conjugate. Data from five flights flown during a period of medium geomagnetic activity in Mar. 1968 have revealed that whereas the auroras observed in the region of the hydrogen arc remain conjugate during geomagnetic activity, similarities may be found in the poleward auroral forms, but similar forms are displaced up to several hundred kilometers. Before and during the initial phase of the auroral breakup, auroral forms in the Southern Hemisphere are displaced magnetic west of their Northern Hemisphere counterparts. After the breakup an eastward displacement is observed. It is also found that during higher activity the Southern Hemisphere auroras move equatorward of the Northern Hemisphere auroras. Although the data are not conclusive, seasonal effects in the conjugacy of auroras are not indicated. The fall and spring data show that auroras over Alaska are generally brighter than the auroras observed

south of New Zealand, indicating a hemispherical asymmetry in the particle precipitation.

K-10344
Hessler, V.P. , Heacock, R.R., Troitskaia, V.A.
MICROPULSATIONS AT GEOMAGNETIC POLES. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 226-227, 2 refs.

Micropulsation data resulting from cooperative efforts with the Soviets at Vostok Station and the Danish scientists at Qanag, Greeland are discussed. Vostok and Qanag sonagrams show a period of unusual micropulsation activity occurring on May 26, 1967. The form of the event, a Pi burst followed by the rising frequency IPDP event is typical of auroral-oval activity in Alaska and Finland, but rarely appears in the geomagnetic pole data. It is considered an example of similar micropulsation events originating nearly simultaneously on the northern and southern open field lines. Preliminary results from the study of Pc 3 pulsations at the Geomagnetic Pole stations indicate that the activity occurs during the day; there is a marked seasonal variation in amplitude and frequency of occurrence; and more than 50 percent of all registered Pc 3 occurred during the Vostok local summer as opposed to less than 10 percent during the local winter. Similarly the mean summer amplitude of the activity was more than four times the winter value. Similar results are indicated for Qanag.

K-10345
Slichter, L.B. , Hager, C.L., Syrstad, E., Jackson, B.V., Zurn, W.E.
EARTH TIDES AND EARTH'S FREE VIBRATIONS: OBSERVATIONS AT THE SOUTH POLE. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 227-228, 4 refs.

In a gravity earth-tide measurement the largest component is the corresponding reading that theoretically would have occurred on a perfectly rigid earth. Errors as large as 1.1 micro gals may occur in computing the basic rigid-earth tide by usual computer programs. A new program of suitable accuracy and economy has recently been developed and tested which computes the tide with an accuracy of 0.01 micro gal. The objective of observing the earth's free vibrations at the South Pole has received encouragement by the recent success with gravimeters in observing free vibrations produced by earthquakes of moderate magnitudes, such as the Colombian earthquake of July 31, 1970, of reported magnitude 6.8.

K-10377
Pomerantz, M.A. , Duggal, S.P.
NORTH-SOUTH ANISOTROPIES IN THE COSMIC RADIATION. Journal geophysical research, Jan. 1972 77(1), p.263-265, 6 refs.

Analysis of cosmic-ray intensity data obtained with continuously operating ground-based detectors in the polar regions and elsewhere has revealed several spectacular manifestations of complex three-dimensional flow patterns in the inner solar system. This note exemplifies three of these manifestations which displayed unusual features and emphasizes that significant off-ecliptic anisotropy is a common occurrence. Most of 85 cosmic-ray storms during the minimum and maximum epochs of the current solar cycle were characterized by demonstrable north-south asymmetry. Hence it is almost self-evident that a varying (although often small) intensity gradient perpendicular to the ecliptic plane is an essential feature of all cosmic-ray modulation mechanisms, although its direct measurement remains an exceedingly difficult problem.

K-10396
Huruhata, M.
AIRGLOW INTENSITY OBSERVED IN THE SOYA JAPANESE EXPEDITION SHIP TO THE ANTARCTIC 1956-1962. Japanese Antarctic Expedition. Scientific reports. Series A: Aeronomy, Oct. 1963 No.2, 38p., 12 refs.

Airglow observations were carried out on the Soya Japanese expedition ship to Antarctica between Tokyo and Showa Station from the first expedition in 1956/57 through the sixth expedition in 1961/62. The observed intensities of emissions of 5577A, 5893A, 6300A, and near infrared OH are shown. Tabular data include the dates and positions of the ship at local midnight, the local time, and the observed zenith intensity given in Rayleigh units.

K-10397
Ayukawa, M.
RECORDS OF ALL-SKY CAMERA OPERATIONS AT SYOWA STATION, ANTARCTICA IN 1966. Japanase Antarctic Research Expedition. Scientific reports. Aurora, Aug. 1968 No.1, 14p.

Since 1959, an all-sky camera for aurora observation has been operated at Showa Station, with an intermission from 1962 to 1965. This report briefly presents the data of the all-sky camera records obtained in 1966. A 16 mm Bolex movie camera (model H-16RX with f/1.4, 25 mm in focal length) was operated every night between Mar. 11 and Oct. 20, 1966, with some intermission due to blizzards or instrument troubles. Fifteen-second exposures were made at intervals of 30 sec. The film was black and white Fuji 16 mm Hs, with a sensitivity of ASA 320. The days of observation, hours of observation, and K-indices are shown.

K-10398
Ose, M. Nishimuta, I.
RIOMETER RECORDS OF 30 MHZ COSMIC NOISE AT SYOWA STATION, ANTARCTICA FROM FEBRUARY 1967 TO FEBRUARY 1968. Japanese Antarctic Research Expedition. Scientific reports. Ionosphere, Nov. 1968 No.2, 62p.

Observations of 30 MHz cosmic radio noise at Showa Station, Antarctica have been carried out since Feb. 1966 using a standard riometer to measure the absorption in the ionosphere. In Dec., Jan. and February, the summer season in Antarctica, quiet days prevail but from the latter part of Mar. disturbed days associated with polar cap absorption (PCA) and aurora begin to increase, until late in Nov. Generally speaking, in summer with many sunlight hours, radio disturbances associated with PCA and aurora seem to be less. The maximum and minimum values of the diurnal variation of quiet days, depending on the sidereal time, are reversed in summer in respect to winter, with a gradual change throughout the year. In Sept. and Oct. the maximum values shift greatly, attributed to the fact that the sunlight hours increase and summer sets in suddenly in Antarctica.

K-10399
Ayukawa, M.
RECORDS OF ALL-SKY CAMERA UTILIZATION AT SYOWA STATION, ANTARCTICA, 1967. Japanese Antarctic Research Expedition. Scientific reports.

Aurora, Dec. 1968 No.3, 11p.

An all-sky 16 mm Bolex movie camera (model H-J6RX with f/1.4, 25 mm in focal length) was used in aurora observations during 1967 at Showa Station, Antarctica. The camera was operated during clear days between Mar. 5 and Oct. 20, 1967. Fifteen sec exposure was made at intervals of 30 sec, with black and white film, Fuji 16 mm HS, sensitivity: ASA 320. The days of observation, hours of observation, and K-indices are shown.

K-10401
Ishizawa, K.
RIOMETER RECORDS OF 30 MHZ NOISE AT SYOWA STATION, ANTARCTICA FROM FEBRUARY 1968 TO JANUARY 1969. Japanese Antarctic Research Expedition. JARE data reports. Ionosphere, March 1970 No.7, [64]p.

30 MHz cosmic noise has been recorded at Showa Station, Antarctica using a standard riometer. The riometer-received zenithal cosmic noise, and variation of the radio wave intensity recorded on the riometer are affected by absorption in the ionosphere. If the ionosphere is in a quiet state, the diurnal variation of the cosmic noise power can be measured by radio. However, further variation takes place because of seasonal and diurnal variations or shorttime abnormal absorption in the ionosphere. On account of movement of the earth, the time (local time) at which the same radio source passes the zenith gets earlier by about 4 min day after day and is restored to the original state in a sidereal year. The monthly average of diurnal variation in the maximum values and minimum values of radio intensity at Showa Station are shown. Throughout the year, especially in winter (May to Oct.), many absorption phenomena accompanied by polar cap absorption and aurora were observed; it was rather quiet in summer (Nov. to Apr.).

K-10402
Ota, Y.
RIOMETER RECORDS OF 30 MHZ COSMIC AT SYOWA STATION, ANTARCTICA 1969. Japanese Antarctic Research Expedition. JARE data reports. Ionosphere, Nov. 1970 No.8, [74]p.

Cosmic radio noise at 30 MHz was recorded at Showa Station by a standard riometer, connected to a vertically directed five-element Yagi antenna. Since the absorption values are read in the sidereal time shift four min. per day in the scaling of the cosmic noise absorption data in local time, the phase of the sidereal-time variation for the cosmic noise absorption in the summer becomes just opposite to that in the winter. The range of the daily variation and the average for the cosmic noise absorption during the summer (Dec.-Jan.) at Showa Station are smaller than those during the winter (June-July), because the time of maximum absorption for the sidereal-time variation during the summer coincides with the local zone for the daily maximum ionospheric absorption.

K-10404
Kaneda, E.
RECORDS OF ALL-SKY CAMERA UTILIZATION AT SYOWA STATION, ANTARCTICA IN 1968-1969. Japanese Antarctic Research Expedition. JARE data reports. Aurora, March 1971 No.10, 21p.

An all-sky 16 mm Bolex movie camera (model H-16RX with f/1.4, 25 mm in focal length) was used in aurora observations at Showa Station, Antarctica in 1968-69. The camera was operated during clear days between March 1 and October 18, 1968 and March 17 and October 21, 1969. Fifteen-second exposure was made at intervals of 30 seconds, with black and white film, "Fuji 16mm HS, sensitivity: ASA 320." The days and hours of observations and K-indices are shown.

K-10406
Ayukawa, M.
RECORDS OF ALL-SKY CAMERA UTILIZATION AT SYOWA STATION, ANTARCTICA IN 1970. Japanese Antarctic Research Expedition. JARE data reports. Aurora, Aug. 1971 No.13, 19p.

Two all-sky camera were used in aurora observations in 1970 at Showa Station, Antarctica--a 16mm Bolex movie camera (model H-16RX with f/1.4, 25 mm focal length) and a 35mm Automax cine-pulse camera (model G-4SD with f/3.5, 40mm in the focal length of the main lens, with a fish-eye lens) Fifteen-sec-exposure was made at intervals of 30 sec, with black and white film (Fuji 16mm HS, sensitivity: ASA 320) The 35 mm camera was operating during clear nights between Mar. 2 and Oct. 18, 1970. Two exposures were made every minute, i.e. 0-30 sec. and 40-55 sec. The film used was Kodak 35mm 4-X, sensitivity ASA 800. The days and hours of observations and K-indices are shown.

K-10407
Wakai, N. , Fujii, S., Miyamoto, Y.
HF RADIO WAVE ABSORPTION IN THE NIGHTTIME. PART II. MEASUREMENTS OF THE FIELD INTENSITY OF HF RADIO WAVES BY MEANS OF NARROW BAND RECEIVERS. Antarctic record, July 1971 No.41, p.1-8, In Japanese with English summary. 4refs. Also published in Radio Research Laboratories. Review, 17(91):297-301, July 1971

Narrow-band receivers developed for exclusively receiving JJY signals in the presence of interference by the other standard frequency waves with an identical carrier frequency have been used since 1967 for the observation of HF radio wave absorption on board the ship of the Japanese Antarctic Research Expedition. This paper summarizes the technical aspects of the receiver, and presents the results of measurements obtained by the 10th JARE (Nov. 1968-Apr. 1969). Dependence of ionospheric absorption in the nighttime on solar activity was confirmed quantitatively by the same analysis as that given in Part I (1971; K-10004) of this paper. (Auth.)

K-10408
Wakai, N.
HF RADIO WAVE ABSORPTION IN THE NIGHTTIME. PART III. RAY PATHS AND ABSORPTION OF MF AND HF RADIO WAVES INCIDENT AT THE NIGHTTIME IONOSPHERE. Antarctic record, July 1971 No.41, p.9-23, In Japanese with English summary. 9 refs. Also published in Radio Research Laboratories. Review, 17(91):302-310, July 1971.

Computations of the ray path and absorption of radio waves by means of the ray-tracing technique are applied to the oblique propagation of MF and HF waves passing through model ionospheres in the nighttime under different conditions. The field intensity deduced from the computed results is discussed in comparison with that measured on board the ship of the Japanese Antarctic Research Expeditions are reported in Parts I (K-10004) and II (K-10407) of this paper. To a certain degree it is quantitatively confirmed that ionization in the nighttime E region is responsible for the absorption of MF and lower HF waves. (Auth.)

K-10409
Kamada, T. , Tokuda, S.
ARRIVAL DIRECTION AND OCCURRENCE FREQUENCY OF ATMOSPHERICS AT SYOWA STATION IN ANTARCTICA. Antarctic record, July 1971 No.41, p.24-33, 1 ref.

The results of observations for distant sources of atmospherics at Showa Station are described. In almost all seasons the arrival direction of atmospherics at Showa Station is mostly the north. Active thunder areas, such as Central and South Africa and Madagascar, exist in the northwest direction from Showa Station in all seasons and the distance to those areas from Showa Station in each season is shorter than other thunder areas on the earth. The frequency of atmospherics received at Showa Station is the highest in the summer season and is generally higher in the nighttime than in the daytime. The frequency of atmospherics during blizzards is sharply increased, which may be due to the origin of atmospherics in the polar low pressure area within the storm zone.

K-10415
Ben'kova, N.P. , Bukin, G.V., Tien, C.K.
CONJUGATE DISTURBANCES IN THE INOSPHERIC F2-REGION. Geomagnetism and aeronomy, Jan. 1972 11(4), p.513-517, Translation from Geomagnetizm i aeronomiia, 11(4):602-607, 1971. 8 refs.
QC811.G383

The vertical ionization profiles during disturbances at two pairs of magnetically conjugate stations, Sogra-Kerguelen on Oct. 5 and 17, 1966, and Washington-Port Stanley (Falkland Is.) on Sept. 23 and Oct. 22, 1957, are examined. It was found that during antiphased disturbances the variations in ionization density differ in the upper part of the F-region and below this level. The aerodynamic and electrodynamic hypotheses of the conjugation of disturbances are discussed.

K-10416
Mansurov, S.M. , Mansurova, L.G.
ANNUAL GEOMAGNETIC FIELD VARIATIONS IN POLAR CAPS. Geomagnetism and aeronomy, Jan. 1972 11(4), p.560-563, Translation from Geomagnetizm i aeronomiia, 11(4):660-664, 1971. 14 refs.
QC811.G383

Evidence is presented that the annual geomagnetic field variation in polar caps is produced not only by the periodic variation of the angle between the ordered motion of solar plasma and the geomagnetic dipole axis, but also by the interaction of the magnetic fields of space and of the Earth. Observations in Antarctica were made at Vostok, Dumont d'Urville, and Mirnyy Stations from 1954 to 1966.

K-10417
Medvedev, N.D.
SECULAR VARIATION OF MAGNETIC DECLINATION IN THE SOUTHERN OCEAN AND STABILITY OF THE POSITION OF THE ZERO D ISOPOR. Geomagnetism and aeronomy, Jan. 1972 11(4), p.636-637, Translation from Geomagnetizm i aeronomiia, 11(4):744-745, 1971. 6 refs.
QC811.G383

The values of the magnetic declination, D, obtained by James Cook's 1773-74 Expedition around Antarctica and from a modern D map for the 1965 epoch and the difference thereof determining average annual values of the secular pattern over 192 years, are given. Coordinates of the points where the secular D variations, obtained from a comparison of the data of the expeditions of Cook, Kruzenshtern-Lisianskii, Bellingshausen, and Ross with the data of the modern D map for the 1965 epoch are close to zero, define the zero isopor of magnetic declination which has been stable for the last 100-200 yr.

K-10460
Masley, A.J.
MCDONNELL DOUGLAS GEOPHYSICAL OBSERVATORY PROGRAM PROGRESS REPORT X. McDonnell Douglas Astronautics Corporation. Report, Dec. 1971 MDC-G2736, 38p., 15 refs.

Continuing studies of the characteristics of solar cosmic ray events at the MDAC Antarctic Geophysical Observatory at McMurdo Sound and the magnetically conjugate Arctic Observatory at Shepherd Bay, Canada are discussed. The equipment in operation at the observatories includes 30 and 50 MHz riometers, single-axis (McMurdo Sound) and three-axis (Shepherd Bay) flux-gate magnetometers, and auroral photometers. Analog data are recorded on a multipoint recorder and digitized data on magnetic tape. During 1971, 11 events were observed with absorption at 30 MHz>0.4 dB. This represents a further decrease in total number from the previous year; however, two of the 1971 events were larger than any in 1970.

K-10464
Amayenc, P. , Bertin, F., Papet-Lepine, J.
LATITUDINAL VARIATIONS OF THE ELECTRON CONTENT OF THE IONOSPHERE. Sur l'evolution latitudinale du contenu electronique de l'ionosphere. Annales de geophysique, July-Sept. 1971 27(3), p.345-357, In French with English summary. 21 refs.

Diurnal and latitudinal variations of the electron content of the ionosphere were studied by differential Faraday effect (40 and 41 MHz). Results obtained from winter 1964-1965 through winter 1966-1967 are described season by season in the latitude range 40 through 70 N. It is shown that the elevation of the Sun controls the electron content, particularly in winter and spring. As anomalies appear to be dependent on latitude the geophysical mechanisms to produce the phenomena are discussed. In connection with the electron content anomaly during sunset, observations at Kerguelen Is. show a strong magnetic declination causing neutral downward winds toward the end of the afternoon which lead to a decrease of the height of maximum ionization and consequently an increase of electron content even though the density at maximum ionization level remains constant.

K-10465
Rajaram, G. , Bastogi, R.G.
SYNOPTIC STUDY OF THE DISTURBED IONOSPHERE DURING IGY-IGC. (2) THE AMERICAN ZONE. Annales de geophysique, July-Sept. 1971/27(3), p.359-367, 10 refs.

A detailed investigation of the Dst (f0F2) and S(D) (f0F2) behavior for individual stations in the American zone ranging from 89 N dip to 75 S dip has brought out some anomalies in the known behavior of disturbance-effects. Seasonal categorization shows the existence of an enhanced ratio of D/Q (f0F2) in the winter midlatitudes, stronger by night than by day, and stronger than the corresponding ratio at the magnetic equator. The 'peak' is larger in the southern American zone, and seems to be associated with the geomagnetic anomaly observed in this region. (This study is a sequel to a previous paper on the F2 disturbance effects in the Asian Zone.)

(Auth.)

K-10478
Fremouw, E.J. , Bates, H.F.
WORLDWIDE BEHAVIOR OF AVERAGE VHF-UHF SCINTILLATION. Radio science, Oct. 1971 6(10), p.863-869, 48 refs.

A description of the latitudinal, diurnal, seasonal and solar-cycle variations of F-layer-produced scintillations, based on a comprehensive review of the literature, is given. Three distinct latitudinal regimes are discussed in regard to scintillation behavior and the quantitative utility of observations reported in the literature. Data from Scott Base indicate that between 1965 and 1968 the average scintillation index increased between 70 and 80 deg geomagnetic latitude. The increase was small but present, on the average, through all hours of the day. A semi-quantitative empirical model is suggested to describe the strength of scintillation-producing irregularities of F-layer electron density.

K-10507
Lockwood, J.A.
FORBUSH DECREASES IN THE COSMIC RADIATION. Space science review, Dec. 1971 12(5), p.658-715, 115 refs.
QB1.S77

The experimental observations of Forbush decreases in recent years are reviewed and related to different theoretical models which have been proposed. The observational data from both ground-based and spacecraft experiments were selected to illustrate the important characteristics of Forbush decreases. Data from neutron monitors at the South Pole, Kerguelen Is., and Wilkes, McMurdo, and Mawson stations have been included. The form of the rigidity dependence of the cosmic-ray modulation during the decreases and effects of the geomagnetic field upon the magnitude of the decreases are discussed. Recent results to deduce the cosmic-ray flow patterns from the observed anisotropies during the decreases are presented. Other features such as differences in onset times, recovery times, precursory increases are discussed. In considering the theoretical models particular emphasis is placed upon the agreement of the predictions of the model with the experimental observations. A theoretical model is suggested which is not original but represents a synthesis of several models previously proposed. Future important measurements and analyses necessary to an understanding of Forbush decreases are outlined. (Auth. mod.)

K-10508
Rishbeth, H.
THERMOSPHERIC WINDS AND THE F-REGION: A REVIEW. Journal of atmospheric and terrestrial physics, Jan. 1972 34(1), p.1-47, 105 refs.
QC801.J6

This review deals with the neutral-air winds that blow in the upper atmosphere at heights above about 150 km. Starting from a discussion of the forces acting on the air, the equations of motion are set up and solved, enabling various properties of the wind systems to be deduced. The effects of the winds on the ionospheric F2-layer are considered in some detail, including an explanation of their contribution to the Universal Time effect observed in the Antarctic.

K-10521
Torr, M.R.
NIGHT-TIME ENHANCEMENTS IN THE 6300 A LINE AT SANAE AND THE RELATION TO THE MOVEMENT OF THE AURORAL OVAL. Annales de geophysique, 1971 27(2), p.201-204, 9 refs.
QC801.A64

Observations of the 6,300 A line at SANAE in winter show large enhancements in the vicinity of midnight. These enhancements are usually accompained by Es and increases in the 30 MHz riometer absorption. For most of the night hours for the months May to July 1964, the ionospheric trace was missing due to nondeviative absorption. The data indicate that energetic electrons are precipitating into the ionospheric blackout; a higher energy component (>10 KeV) producing increased absorption which results in ionospheric blackout, and a lower energy component (<2 KeV) producing the 6,300 A enhancements. Further, as the enhancements always occur during periods of high magnetic activity, it is suggested that they are due to the diurnal excursion of the auroral oval towards SANAE (59 deg invariant latitude) which reaches to lower latitudes at these times. (Auth.)

K-10525
Hirasawa, T.
WORLDWIDE CHARACTERISTICS OF GEOMAGNETIC PC-PULSATIONS WITH THE PERIOD FROM 10 TO 150 SECONDS DURING ACTIVE-SUN YEARS. Report of Ionosphere and Space Research in Japan, Dec. 1969 23(4), p.281-293, 14 refs.
QC801.J3

An attempt is made to get the average dependence of pc-periods on geomagnetic latitude by using the IGY data obtained at 13 stations distributed from high to low latitudes including Port aux Francais Station. It is found that there is a distinct dependence of pc-period on geomagnetic latitude. Referring to this result, it is reasonable to classify the geomagnetic pc-pulsations (pc 4 and pc 3 range, 10-150 sec. in period) into four kinds: (A) polar pc, (B) middle-latitude pc, (C) submiddle-latitude pc and (D) short period pc. The diurnal tendencies of each type pulsation are tabulated and the possible origins of the pulsations discussed. (Auth. mod.)

K-10538
Lanzerotti, L.J.
SOLAR ENERGETIC PARTICLES AND THE CONFIGURATION OF THE MAGNETOSPHERE. Reviews of geophysics and space physics, Feb. 1972 10(1), p.379-393, 68 refs.
QC801.R46

Since the original study of PCA riometer measurements, solar energetic particles have been increasingly employed as test particles in the magnetosphere. The characteristics of the access of these particles to the magnetosphere are studied to determine if substantial connection exists between the earth's dipole field and the solar-generated interplanetary field. Satellite measurements over the polar cap indicate strong north pole-south pole proton flux asymmetries that may be related to existing interplanetary particles anistropies. High-latitude measurements indicate significant pseudotrapping of the solar fluxes on closed magnetospheric field lines. Particle flux comparisons between satellites in interplanetary space and within the magnetosphere suggests that the particle access point is probably not greater than 1000 earth radii behind the earth in the magnetotail. (Auth.)

K-10560
Rao, U.R.
SOLAR MODULATION OF GALACTIC COSMIC RADIATION. Space science review, Jan. 1972 12(6), p.719-809, Refs.
QB1.S77

In this review an attempt is made to present an integrated view of the solar modulation process that causes time variation of cosmic ray particles. After briefly surveying the relevant large and small scale properties of the interplanetary magnetic fields and plasma, the motion of cosmic ray particles in the disordered interplanetary magnetic fields is discussed. The experimentally observed long term variations of different species of cosmic ray particles are summarized and compared with the theoretical predictions from the diffusion-convection model. The effects of the energy losses due to deceleration in the expanding solar wind are clearly brought out. The radial density gradient, the modulation parameter and their long term variations are discussed to understand the dynamics of the modulating region. The cosmic ray anisotropy measurements at different energies are summarized. Neutron monitor data from Kerguelen Is., Mawson and Wilkes stations, and McMurdo Sound are included in the analyses of anisotropic variations of cosmic radiation.

K-10567
Webber, G.E. , Peden, I.C.
VLF FIELDS OF A HORIZONTAL DIPOLE BELOW THE POLAR ANISOTROPIC IONOSPHERE. IEEE transactions on antennas and propagation, July 1971 AP-19(4), p.523-529, 17 refs.
TK7800.I2

A study is made of VLF fields excited by a horizontal dipole in the waveguide formed between the ice-covered ground and the anisotropic ionosphere of Antarctica. Numerical results are presented which describe the excitation, propagation, and polarization of radiated energy for ionospheres typical during both summer (daylight) and winter (night) conditions in Antarctica. The polarization of fields observed at the ice surface is found to be a function of both azimuth and range. Ice layer characteristics have significant effects on received fields, especially those of the quasi-TM type. The possible excitation of a TM-type surface wave at the ice-air interface under special conditions is also discussed. Fields propagating with wave numbers corresponding to quasi-TE modal solutions are least attenuated in the waveguide. Summer ionospheres tend to increase modal attenuation rates. Results are applied to a real experimental situation in Antarctica involving a horizontal dipole source and trans-Antarctic propagation paths. (Auth.)

K-10598
Doyen, P.
AURORA. BASE ROI BAUDOUIN, MARCH 1, 1964 - OCTOBER 6, 1966. Aurorea. Base Roi Baudouin, 1 mars 1964 - 6 octobre 1966. Brussels, Exantar, 1971, 111p., In French. 10 refs.

The auroral data of the 1964-1965-1966 Belgian-Netherlands Antarctic Expedition at Roi Baudouin Station published in the volume are observations taken from March 1, 1964 to Oct. 6, 1966. Data tabulations are prefaced with information on the visual method of observation, time of observation, type of data, geographic position, and a listing of descriptive symbols.

K-10608
Padula Pintos, V.H.
ANTARCTIC AND TRANSANTARCTIC COMMUNICATIONS. Comunicaciones antarticas y transantarticas. Buenos Aires. Instituto Antartico Argentino, Contribucion, 1970 No.134, In Spanish with English, French, German, and Italian summaries. 17 refs.

A general review of the state of present Antarctic and Transantarctic radio communications is given. Possibilities and plans for future studies in the ionosphere are outlined.

K-10615
Stenbaek-Nielsen, H.C. , Davis, T.N.
RELATIVE MOTION OF AURORAL CONJUGATE POINTS DURING SUBSTORMS. Journal of geophysical research, April 1972 77(10), 11 refs.
QC811.J6

Aircraft observations of the conjugacy of visual auroras at Barrow, College, Campbell I. and Honolulu during a disturbed period in late Mar. 1968 show the existence of two auroral systems. An equatorward arc system, composed of weak multiple arcs (and, in evening, the hydrogen arc), lying near invariant latitude 63 to 65 deg shows a high degree of conjugacy with little or no displacement of conjugate auroras relative to the GSFC 12/66 model of the geomagnetic field. Separated from this system is a poleward arc system where conjugate auroras occur but similar auroras are displaced by up to 300 km. Before the auroral breakup, the southern hemisphere auroras are displaced westward to their northern counterparts. At the time of the breakup, the sense of the longitudinal displacement reverses so that, thereafter, the southern auroras occur eastward of their northern conjugates. An equatorward displacement of the southern hemisphere poleward arc system occurs during magnetic activity. (Auth.)

K-10626
ROCKET OBSERVATIONS OF AURORA AT SYOWA. Antarctic, Sept. 1971 6(3), p. 96
G845.A55

A series of rocket observations of the aurora was started at Showa Station on June 24, 1971 by members of the winter team of the 12th Japanese Antarctic Research Expedition. Three S160 rockets with a range of 90 km, have been launched since Feb. 10, 1970. The first of six S210 rockets was launched successfully but developed electrical trouble in the observation equipment 8.3 sec after launching. The rocket is 5m long, 21 cm. in diam, and weighs 260 kg.

K-10652
Webber, G.E. , Peden, I.C.
VLF MODE ANALYSIS USING A CERAMIC DIELECTRIC MODEL OF THE EARTH-IONOSPHERE WAVEGUIDE. IEEE transactions on antennas and propagation, Sept. 1969 AP-17(5), p.613-620, 21 refs.
TK7800.I2

The mode content of very-low-frequency (VLF) energy propagating away from a horizontally polarized source over long ice-covered paths is studied by means of a laboratory model of the earth-ionosphere waveguide that incorporates one lossy wall. A reflecting upper boundary simulates the nighttime ionosphere; powdered ceramic materials are used at 4 GHz to represent the 15 kHz properties of air and Antarctic ice. The model is a flexible experimental tool potentially applicable to a number of propagation problems. In terms of the immediate study, namely, VLF propagation on the Antarctic

continent, it is demonstrated that the three lowest TE modes are sufficient to represent the total far field under the assumed conditions. The laboratory results agree well with theoretical predictions; their relationship to ray concepts is pointed out. (Auth.)

K-10673
Huruhata, M. , Nakamura, J.
ABSOLUTE INTENSITY OF 5577 A (OI) EMISSION AT SYOWA STATION DURING THE IGC, 1959. Tokyo, National Committee for the International Geophysical Coordination, Science Council of Japan, 1962, 124p.
QC972.H8

Photoelectric observations of 5577A (OI) emission were carried out at Showa Station from Feb. to Oct. 1959 using a semi-scanning type photometer (objective lens 130 mm in focal length and aperature ratio F/2.8). The data included the dates of observations, the time in G.M.T., sky conditions, and the absolute intensity of aurora in kilo rayleighs at zenith distance 64.4 deg in the south for every 6 min.

K-10677
Wakai, N. , Ose, M., Tanohata, K.
SOLAR CONTROL OF HF RADIO WAVE ABSORPTION IN THE NIGHTTIME--MEASUREMENT OF THE FIELD INTENSITY OF HF RADIO WAVES ON BOARD THE SHIP FOR THE SECOND (1958) TO EIGHTH (1966) JAPANESE ANTARCTIC RESEARCH EXPEDITIONS. Radio Research Laboratories. Review, Nov. 1970 16(87), p.558-569, In Japanese with English summary. Also: Radio Res. Labs., J. (Tokyo), 18(95):1-17, Jan. 1971, 8 refs. 18 refs.
QC973.D43

Observations of nighttime ionospheric absorption carried out since 1958 on a Japanese Antarctic research ship are reviewed. The technique used in the measurement of the hf radio wave field to determine small portions of absorbed radiation at midnight time is described. Proof is obtained for the occurrence of radio wave absorption in the ionosphere, and the dependence of this absorption on solar activity is demonstrated over a nine year declining period of the last solar cycle. An expression is proposed tentatively for estimating nighttime radio wave absorption in the Antarctic ionosphere. (Auth.)

K-10678
Miyazaki, S. , Ose, M.
ROCKET OBSERVATIONS OF THE IONOSPHERE AT ANTARCTICA. Radio Research Laboratories. Review, May 1971 17(90), p.287-291, 5 refs.
QC973.D43

The twelfth Japanese Antarctic Research Expedition team will launch an S-160 JA rocket and six S-210 JA rockets to observe the polar ionosphere and auroral phenomena at Showa Base, Antarctica. The plasma probes to be installed on the rockets and problems of ionospheric measurement are described. (Auth. mod.)

K-10679
Aikyo, K. , Ondoh, T.
PROPAGATION OF NONDUCTED VLF WAVES IN THE VICINITY OF THE PLASMAPAUSE. Radio Research Laboratories. Review, May 1971 17(90), p.153-182, 30 refs.
QC973.D43

It is well known that the propagation of whistlers and VLF emissions is strongly influenced by the plasmapause. Carpenter (1963; K-903) first showed, by the analysis of ground based whistler data, that the probability of observing whistlers in the tenuous density region outside the plasmapause (plasma trough) is lower than that of whistlers in the dense region (plasmasphere). Recent whistler observations by Alouette I satellite and at Antarctic ground stations indicate a close relation between positions of the plasmapause derived from nose whistlers and cutoff positions of short whistler activities (Carpenter et al, 1968; K-6239). The present work investigates the propagation characteristics of the nonducted whistler mode waves for new electron density distributions with the plasmapause drop by the use of the ray-tracing technique. Magnetospheric electron density distributions are developed by a linear combination of the diffusive equilibrium model in the plasmasphere and the collisionless model in the plasma trough.

K-10680
Wakai, N. , Fujii, S., Miyamoto, Y.
MEASUREMENT OF THE FIELD INTENSITY OF HF RADIO WAVES BY MEANS OF THE NARROW BAND RECEIVER. Radio Research Laboratories. Review, May 1971 17(90), p.183-190, 4 refs.
QC973.D43

The narrow band receiver developed for receiving exclusively JJY (Tokyo Transmitting Station) signals in the presence of interference by other standard frequency waves with an identical carrier frequency has been used since 1967 for the observation of HF radio wave absorption in the nighttime on board the ship for the Japanese Antarctic Research Expedition (JARE). This paper gives a technical summary of the receiver, and presents the results of measurements obtained by the receiver on the 10th (Nov., 1968 - Apr. 1969) JARE. Dependence of the ionospheric absorption in the nighttime on the solar activity was confirmed quantitatively by the same analysis as in a preceding paper (K-10677).

K-10681
Wakai, N.
RAY PATHS AND ABSORPTION OF MF AND HF RADIO WAVES INCIDENT ON THE NIGHTTIME IONOSPHERE. Radio Research Laboratories. Review, May 1971 17(90), p.191-208, 6 refs.
QC973.D43

Computation of the ray path and absorption of radio waves by means of the ray-tracing technique is applied to the oblique propagation of MF and HF waves passing through model ionospheres in the nighttime in different conditions. The field intensity deduced from the results of computation is compared with that measured on shipboard during the Japanese Antarctic Research Expeditions and previously reported. It is confirmed quantitatively that to a certain degree the ionization in the nighttime E region is responsible for the absorption of MF and lower HF waves.

K-10693
Carpenter, D.L. , Fraser-Smith, A.C., Unwin, R.S., Hones, E.W., Jr., Heacock, R.R.
CORRELATION BETWEEN CONVECTION ELECTRIC FIELDS IN THE NIGHTSIDE MAGNETOSPHERE AND SEVERAL WAVE AND PARTICLE PHENOMENA DURING TWO ISOLATED SUBSTORMS. Journal of geophysical research, Nov. 1971 76(31), p.7778-7786, 27 refs.

Several magnetoionospheric wave and particle phenomena previously linked observationally to

magnetospheric substorms and inferred to involve convection electric fields are correlated with whistler measurements of convection activity during two relatively isolated substorms. The events occurred at about 0600 UT on July 15, 1965, and about 0500 UT on October 13, 1965. The correlated phenomena include (a) cross-L plasma drifts near midnight within the plasmasphere, (b) diffuse auroral radar echoes observed near the dusk meridian, (c) IPDP micropulsations (intervals of pulsations of diminishing period) in the premidnight sector, (d) apparent contractions and expansions of the plasma sheet at about 20 RE in the magnetotail, and (e) Pc 1/Pi 1 micropulsation events near or before midnight. Two new VLF phenomena occurred during the October 13 event, a noise band within the plamasphere associated with a convecting whistler path and "hisslers," falling-tone auroral-hiss forms repeated at intervals of 2 sec. The cross-L plasma drifts, the Pc 1 events, and the VLF banded noise were observed at Eights, Antarctica. The VLF auroral-hiss forms were observed at Byrd, Antarctica. (Auth. mod.)

K-10722
Diesendorf, M.O.
AMPLITUDE VARIATIONS IN ARTIFICIALLY STIMULATED V.L.F. EMISSIONS. Nature physical science, March 1972 236(65), p.56-58, 11 refs.
Q1.N22

Observations are reported on large regular and irregular classes of amplitude fluctuation within artifically stimulated VLF emissions triggered by low power Omega pulses of frequency 10.2 kHz received on the ground in the magnetically conjugate zone of the transmitter after following a magnetospheric trajectory. The amplitude variations studied were associated with nine pulses from a 2 min sequence of Omega pulses transmitted from Forest Port, New York, and received and recorded by Stanford Univ. at Eights Station, Antarctica (L =4), on May 9, 1963, at 0650 UT. Two kinds of amplitude variation were evident: (1) deep beating between falling tones at the end of the pulse and the total signal to 10.2 kHz, and (2) blobs of emission defined by sudden enhancements and fadings in amplitude, with blob durations generally in the range 2 ms to 20 ms.

K-10724
Shiro, I. , Sakamoto, T.
RIOMETER RECORDS OF 30 MHZ COSMIC NOISE AT SYOWA STATION, ANTARCTICA IN 1970. Japanese Antarctic Research Expedition. JARE data reports. Ionosphere, Nov. 1971 No. 14, 62p.

Observations of 30 MHz cosmic radio noise with a standard riometer (relative ionospheric opacity meter) have been carried out at Showa Station, Antarctica, Since Feb. 1966. The riometer power is not identical with the cosmic noise power, but should be taken into account. If the ionosphere is in a quiet state, the diurnal variation of the cosmic noise power is easily reduced. However, several complicated variations take place because of seasonal and diurnal variations and short-time abnormal absorptions in the ionosphere. Due to movement of the earth, the time (local time) when the same radio source passes the zenith gets earlier by about 4 min each day and is restored to the original in a year because of the different between solar and sidereal times. The monthly range of time of maximum and minimum value of diurnal variation of cosmic noise power on quiet days is shown.

K-10729
Hodges, J.C.
ESTABLISHMENT OF A POLAR AURORAL RADAR SYSTEM - MCMURDO STATION. Stanford Research Institute, Menlo Park, California, Project 8252, Final Letter Report, April 1972, 5p.

The objectives of the work performed under NSF grant were to place an HF stepped-frequency sounder radar in operating condition and to pack the equipment for shipment to McMurdo Station for the purpose of recording radar echoes from the entire Aurora Australis at different times of the day, year, and solar cycle. An existing DNA radar van was overhauled, modified and put into operation, using an existing antenna, and shipped to Rhode Island, arriving undamaged on Nov. 16. An LPA antenna system, including a 100-ft tower was shipped to McMurdo Station in Nov. Personnel will leave on Jan. 3, for McMurdo to construct the field site and supervise the installation of the antenna tower.

K-10743
Crary, J.H. , Crombie, D.D.
ANTARCTIC ICE CAP ATTENUATION RATES OF VLF SIGNALS DTERMINED FROM SHORT AND LONG GREAT CIRCLE PATHS. Radio science, Feb. 1972 7(2), p.233-238, 13 refs.
QC851.R3

Recordings of the relative phase and amplitude of the signal from GBR, Rugby, U.K., have been made for several years at Byrd Station, Antarctica. Diurnal variations and the behavior of the signal received on a loop and a vertical antenna are consistent with the hypothesis that the dominant signal arrives at Byrd over the short great circle path when it is in maximum darkness and over the long great circle path when it is in maximum darkness. The short and long paths from GBR to Byrd contain portions of the Antarctic ice cap about 1250 and 725 km long, respectively. Calculations were made of the excess attenuation introduced by the ice cap on the two paths when the ice cap is completely dark or illuminated, assuming that the inconsistencies in the signal level over the two paths were due to the additional attenuation over the ice cap. The results indicate that the excess attenuation rate over the sunlit ice cap is between 17 and 31 db/1000 km, which corresponds to a range of conductivities between 0.01 and 0.05 mmho/m for 16 kHz. The nighttime data indicated an attenuation rate of 17 to 22 db/1000 km, which is outside the range of calculated attenuation rate versus conductivity. (Auth. mod.)

K-10744
Akasofu, S.-I.
MIDDAY AURORAS AT THE SOUTH POLE DURING MAGNETOSPHERIC SUBSTORMS. Journal of geophysical research, May 1972 77 (13), p.2303-2308
QC811.J6

It is shown that there is a close relationship between the range of the equatorward shift of the midday aurora and the magnitude of a negative bay at the South Pole station in the midnight sector. Their time variations are also similar. This relationship can be taken to be a clear indication of a close association of magnetospheric substorms with the transfer of the magnetic flux from the front of the magnetosphere to the magnetotail. Furthermore, the intensity of magnetospheric substorms appears to be approximately proportional to the net amount of transferred magnetic flux.

K-10745
Fedder, J.A. , Banks, P.M.
CONVECTION ELECTRIC FIELDS AND POLAR THERMOSPHERIC WINDS. Journal of geophysical research, May 1972 77(13), p.2328-2340, 29 refs.
QC811.J6

Using the qualitative ideas of convection electric fields over the earth's polar regions, the importance of ion drag in establishing a thermospheric wind system is demonstrated. Recent measurements indicate that uniform electric fields of 10 to 40 mv/m are a regular feature of the polar-cap ionosphere. Calculations of the neutral thermospheric wind, using these measured fields in a simple ionospheric model, have been made. The time scale for motion of the neutral gas ranges from less than 1 hr at F-region heights to about 2 hr in the dynamo region of the ionosphere. It has been found that the viscosity of the atmosphere is important in determining the winds in the dynamo region. Results are given that show ion-temperature enhancements of hundreds of degrees that are due to ion-neutral frictional effects. In addition, the total deposition rate of convection energy in the polar thermosphere is shown to be of the same order of magnitude as that due to absorption of solar EUV radiation. The implications of these results for the dynamics and energetics of the thermosphere are discussed. (Auth.)

K-10792
Hodges, J.C.
ANTARCTIC AURORAL RADAR. Trip report Jan.-Feb. 1972, Stanford Research Institute, 1972 Menlo Park, California., 41p.

A chronological account is given of the installation of a radar system at McMurdo Station for the purpose of detecting the auroral oval. Some of the problems encountered are described and the financial status of the grant is given. Several appenixes are included-one a photographic appendix, and others giving accounts of travel time, clothing, personal expenses, and costs. The program officially started on Feb. 17, 1972 when the site was put into automatic operation at 0344Z. No interference was detected. The first ionograms collected are shown.

K-10815
SOLAR FLARE EFFECTS STUDIED. Antarctic, Dec. 1971 6(4), p.129
G845.A55

Soviet research stations in the Arctic and Antarctic were linked recently in a scientific study of the effects of a solar flare. Rockets, weather balloons, and radar were used in the experiment, which lasted 5 days, and there were simultaneous launchings of rockets from Arctic and Antarctic stations, and research centers in the U.S.S.R. Atmospheric density and variations in pressure and wind conditions were noted, and data were recorded on the concentration of electrons and the ion composition of the atmosphere.

K-10837
Lukashkin, V.M.
SEASONAL VARIATIONS IN THE PROPAGATION OF RADIO WAVES IN THE 510-1610 KHZ RANGE ACCORDING TO OBSERVATIONS AT MIRNY OBSERVATORY IN 1965. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.542-545, Translated from its Informatsionnyi biulleten' No.77, 1970. 6 refs.
Q115.S6862

Data on the propagation of radio waves recorded continuously around the clock at Mirnyy Station from Jan. to Oct. 1965 are analyzed. Main patterns for the medium-length radio wave propagation, seasonal variations in propagation caused by regular absorption, and the effect of auroral absorption are discussed. Equipment and methods used for recording radio waves in the 510- to 1610-kHz range between Mirnyy and Wagin, Melbourne, and Lourenco Marques are described.

K-10838
Petruchek, T.P. , Lagutin, M.F., Onufriev, V.P.
RECORDING THE DRIFT VELOCITY OF A METEOR TRAIL AT MOLODEZHNAYA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.545-547, Translated from its Informatsionnyi biulleten' No.77, 1970. 2 refs.
Q115.S6862

The properties of the upper atmosphere, particularly its wind regime, can be studied by the behavior of ionized trails, formed by meteoroids at a height of 85-120 km. The results of experimental measurements of the drift velocity with frequency multiplication made at Molodezhnaya Station in Sept. 1967, and of their statistical analysis are presented in histogram form. The drift velocity method improves the accuracy and reliability of the computed average hourly wind velocities and turbulence characteristics of the meteor zone of the upper atmosphere without changing the transmitter power and the sensitivity of the meteor radar set.

K-10849
Sil'vestrov, L.V. , Checha, V.A.
OBSERVATIONS OF COSMIC RAYS AND OTHER GEOPHYSICAL PHENOMENA AT MIRNY OBSERVATORY IN 1968. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.586-591, Translated from its Informatsionnyi biulleten' No.78, 1970. 5 refs.
Q115.S6862

Preliminary data on variations in the neutron component of cosmic rays, the magnetic field, and PCA phenomena obtained at Mirnyy Station in 1968 are reported, and relationships with optical flares and solar radio noise are analyzed. The methods and equipment used for the study are discussed. Further study of the aforementioned phenomena and comparison of the results with observational data from other stations may possibly yield additional information on the nature of corpuscular streams emitted by the Sun and on other geophysical phenomena.

K-10850
Struin, O.N. , Shirochkov, A.V.
IONOSPHERIC EFFECTS OF SOLAR PROTON FLARES IN 1968 (ACCORDING TO OBSERVATIONS AT VOSTOK STATION). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.591-596, Translated from its Informatsionnyi biulleten' No.78, 1970. 13 refs.
Q115.S6862

PCA phenomena occurring as results of a large number of solar proton flares in 1968 were studied at Vostok Station. Two events are analyzed in detail: June 9-11, during the polar night, absorption exceeding 1 db; and Nov. 18-21, the most intense PCA event of the year, with the lower ionosphere completely illuminated. PCA variations recorded by 30- and 50-MHz riometers were compared to the intensity variations of solar protons recorded by Explorer 34, to signal strength on the VHF ionospheric scatter path

McMurdo-Vostok radio link, and to the variations of minimum reflection frequencies at the ionospheric station. It was concluded that ionospheric scatter VHF communication was more reliable than ordinary short-wave communication at the time of PCA during the polar night. Under stable daytime ionospheric equilibrium conditions, just as under similar nighttime conditions, the temporal variations of radiowave absorption during PCA events are determined by solar cosmic-ray intensity-variations.

K-10851
Shakhov, IU.N.
1968 MAGNETIC MEASUREMENTS AT VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.596-598, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862

An analysis of the scale values obtained at a magnetic variation station (MVS-13) and of the characteristics of the constant magnetic field at Vostok Station in 1968 indicates that the values are very stable. Data on the state of the magnetic field at the station for 1968 and on average annual values of geomagnetic elements for 1958, 1963, 1964, 1966, 1967, and 1968 are tabulated and show that the magnetic field is quietest in winter and the amplitudes of the diurnal patterns and their variations are the smallest. This period is the most convenient for magnetic measurements in the Vostok Station area.

K-10852
Ovsiannikov, E.N.
GEOMAGNETIC OBSERVATIONS AT BELLINGSHAUSEN STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.599-601, Translated from its Informatsionnyi biulleten' No.78, 1970.
Q115.S6862

To obtain data on the geographic distribution of the geomagnetic field in the Antarctic and to determine the conditions for radio communications with Bellingshausen Station, geomagnetic observations were initiated in 1969 at Bellingshausen, the only middle-latitude Soviet Antarctic station. The methods and equipment used in variation and absolute observations and auxiliary stations for the geomagnetic studies are discussed. The results of the absolute measurements show that in the course of a relatively quiet day the horizontal and vertical components vary by 30-50 gamma, and declination by 5 min within 6-8 hr. More sensitive variometers than the present ones must be installed in magnetic stations.

K-10854
Checha, V.A. , Gernandt, H.
ANOMALOUS MEDIUM AND LONG RADIO WAVE PROPAGATION AND PCA EVENTS, ACCORDING TO OBSERVATIONS IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.602-609, Translated from its Informatsionnyi biulleten' No.78, 1970. 8 refs.
Q115.S6862

At Mirnyy in 1968 the protracted anomalous propagation of medium and long waves was observed during 4 PCA events produced by the injection of energetic protons into the atmosphere during enhanced solar activity. The anomalous absorption of medium and low frequencies occurred in the June event; and of long and medium frequencies in the July, Sept.-Oct., and Oct.-Nov. events, all accompained by a decrease in cosmic-ray intensity. Preliminary conclusions are drawn concerning the anomalous propagation in the foregoing cases.

K-10855
Shakhov, IU.N.
EXPERIENCE IN OPERATING A QUARTZ MAGNETIC VARIATION STATION AT VOSTOK. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.609-611
Q115.S6862

A three-component magnetic variation station (MVS) designed for continuously recording declination, and the horizontal and vertical, or northern and eastern magnetic field components was delivered to Vostok Station in 1968. The construction and operation of the equipment, as well as the methods used for the studies, are discussed. A preliminary investigation of the operation of the station showed the need for modernizing the time marking on magnetograms; replacing the factory-produced recorder by a MSV-13 model; and changing of direct thermometer reading of observatory temperature to photorecording.

K-10862
Kaufmann, R.L. , Horng, J.-T.
TRAPPING BOUNDARY AND FIELD-LINE MOTION DURING GEOMAGNETIC STORMS. Journal of geophysical research, June 1, 1972 77(16), p.2780-2798, 34 refs.
QC811.J6

The high-latitude trapping boundary for 20-kev electrons and 100-kev protons became very thin in the early morning hours during two intense substorms occurring on Oct. 27 and Dec. 1, 1961. The gradients were too steep to be maintained by drifting particles, so they must have been produced locally over the nightside of the earth. The flux gradient was seen to move at speeds in excess of 100 km/sec. Plasma appeared to move away from the tail and around the earth at these high speeds during the sudden expansion phases of the substorms. The rapid plasma motion required the presence of fluctuating electric fields that sometimes exceeded 50 to 100 mv/m at a geomagnetic latitude of 30 deg. on the L equals 5 field line. The high-latitude trapping boundary appeared to be distorted by waves. Ground magnetograms from the auroral zone showed the Oct. 27 event to be largest at Byrd, Halley Bay, Novolazarevskaya, and Leirvogur stations.

K-10863
Carpenter, D.L. , Stone, K., Siren, J.C., Crystal, T.L.
MAGNETOSPHERIC ELECTRIC FIELDS DEDUCED FROM DRIFTING WHISTLER PATHS. Journal of geophysical research, June 1, 1972 77(16), p.2819-2834, 28 refs.
QC811.J6

The amplitude of the E-W component EW of the convection electric field in the nightside magnetosphere has been inferred from the observed cross-L motions of whistler ducts within the plasmasphere. Several ducts distributed over 1-2 RE in L space around the longitude of the Eights, Antarctica, whistler station have been tracked simultaneously. The method appears capable of resolving fluctuations in EW with period 15 min and rms amplitude as low as 0.05 mv/m. For variations with T > 1 hour the method has a sensitivity of the order of 0.01 mv/m. Three case studies are presented, two of which illustrate convection activity associated with relatively isolated substorms. In these two

cases EW reversed from westward to eastward for a period following the decay of substorm bay activity. In the third case the substorm bay activity was prolonged, and EW remained westward and at enhanced levels until local dawn. Evidence was found that, at least in a limited longitudinal sector, perturbing substorm EW fields can penetrate deep within the plasmasphere.

K-10864
Hedin, A.E. , Reber, C.A.
LONGITUDINAL VARIATIONS OF THERMOSPHERIC COMPOSITION INDICATING MAGNETIC CONTROL OF POLAR HEAT INPUT. Journal of geophysical research, June 1, 1972 77(16), p.2871-2879
QC811.J6

Measurements of neutral N2, O and He densities from Ogo 6 over the south polar region during magnetically quiet periods in late August and early September 1969 indicate that N2 densities, when they are extrapolated to a common altitude, maximize at about 0800 UT near 70 deg. invariant latitude. The density of He has a minimum at this time, and the density of O has a slight maximum. It is proposed that these phenomena are the result of cyclic variations in soft electron precipitation, which heats the thermosphere either directly or through enhanced Joule heating. This heat energy would increase the gas temperature, the increase in the gas temperature leading to the N2 increase, and would vary the composition by generation of a wind system.

K-10866
Tomoshige, S. , Kodama, M.
REPORT OF COSMIC-RAY NEUTRON OBSERVATION IN THE 9TH JAPANESE ANTARCTIC RESEARCH EXPEDITION 1968-1969. Antarctic record, Dec. 1971 No.42, p.1-15, In Japanese with English summary. 16 refs.

From Feb. 1968 to Jan. 1969, the cosmic ray nucleonic component was observed at Showa Station, Antarctica using a 5-NM-64 super neutron monitor with a multiplicity meter. The annual change of neutron intensity is 9.0 percent in range, showing the maximum in Apr. and the minimum in Nov., with larger disturbance in the second half year than in the first. The multiplicity dependence of the barometric pressure effect and Forbush decreases is surveyed briefly. Using data from three large Forbush decreases, the relation between the multiplicity events and their corresponding primary rigidities is discussed by comparing the latitude dependence of the amount of decrease. Descriptions and data of the solar cosmic ray event of Nov. 18, 1968 are also given.

K-10891
Mercer, J.B. , Barker, D.N.H., Griffiths, W.K., Hatton, C.J.
TRANSIENT NORTH-SOUTH ANISOTROPIES IN THE COSMIC RAY INTENSITY. Planetary and space science, May 1972 20(5), p.721-729, 8 refs.
QC801.P5

Using neutron monitor data from two pairs of stations, Alert-McMurdo and Thule-Amundsen-Scott, a search has been made for North-South anisotropies in the cosmic radiation during the period Aug. 1966-Nov. 1967 (solar rotations 1820-1837). It is found that (a) N-S anisotropies are a common feature of the cosmic radiation, occurring on over 43 per cent of all days, (b) all Forbush decreases are accompanied by such anisotropies in the onset phase, (c) a significant proportion of days outside Forbush decreases (35 per cent of the days analyzed) exhibit N-S anisotropies. The existence of anisotropies with large N-S components is discussed in relation to the study of anisotropies in the ecliptic plane.

K-10892
Hargreaves, J.K. , Bullough, K.
MID-LATITUDE VLF EMISSIONS AND THE MECHANISM OF DAYSIDE AURORAL PARTICLE PRECIPITATION. Planetary and space science, May 1972 20(5), p.803-807, 16 refs.
QC801.P5

Simultaneous observations of VLF noise on the satellite Ariel 3 and of daytime auroral radio absorption at Byrd Station are interpreted to show a linear relationship between the flux of auroral particles and the intensity of mid-latitude VLF emissions. The results are consistent with particle precipitation by a process of weak pitch-angle diffusion. At fluxes near the theoretical trapping limit the pitch-angle distribution becomes isotropic, as would be expected in strong diffusion, but this corresponds to a high level of radio absorption which is observed only infrequently. It is concluded that weak diffusion is the operative mechanism in most cases.

K-10919
Dziubenko, V.I. , Dziubenko, N.I.
RESULTS OF VISUAL AURORAL OBSERVATIONS AT MIRNYY OBSERVATORY (1966). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.465-467, Translated from its Informatsionnyi biulleten' No.76, 1969. 4 refs.
Q115.S6862

The results of auroral observations made from March 26 to Oct. 1966 at Mirnyy Station are summarized. The observational procedure is described and graphs are presented, showing the daily variations of 1) the frequency of occurrence of auroras in the zenith; 2) the frequency of observations of radiant forms and of homogeneous and fibrous arcs and zones in the zenith region; and 3) the ratio of the number of hours with radiant forms to the number of hours with homogeneous and fibrous arcs. Numerical data are provided on the nighttime distribution of radiant auroras in the zenith region. The mean brightness of the 490 auroras observed was 1.7. With increase in latitude there was a systemmatic redistribution of the observed auroral forms, involving an increase in the fraction of radiant auroras and a decrease in the fraction of homogeneous arcs and zones. Diffuse and pulsating surfaces were rarely observed at Mirnyy, but mainly in the northern and northwestern sections. At night, the peak of auroral activity is above Mirnyy; at local midnight, it is to the north; and in the morning, it is closer to the zenith. The radiant forms of auroras predominate over uniform and fibrous arcs in the evening and morning hours; at night, the phenomenon is reversed.

K-10932
Heacock, R.R.
PC 1 MICROPULSATION EVENT OF APRIL 7, 1971. Nature physical science, June 5, 1972 237(75), p.95-96, 4 refs.
Q1.N22

This communication supplements the data presented by Fraser and Summers (Nature Phys. Sci., 235(61):170-171, Feb. 28, 1972) for the Pc 1 micropulsation event of Apr. 7, 1971. They observed the event at two Australian sites and one New Zealand site, and emphasized that the

wave polarizations in the horizontal plane were nearly linear at each site. It was natural to assume, following the theories of Greifinger and Greifinger (1968), that the major axis of the recorded polarization ellipse might indicate the arrival direction of the wave, and, in the absence of complete information on wave propagation characteristics in the ionospheric duct for that time, it was natural to extrapolate linearly from the three sites to determine the location of a probable source for the event. Additional recordings of that Pc 1 activity taken at several Alaska sites and at Macquarie I. suggest that there were further complications and that, in general, extrapolation from the major axes of the ellipses cannot be used to locate the source line of a Pc 1 event.

K-10973
Kolomiitsev, O.P.
IONOSPHERE ABOVE THE SOUTH GEOMAGNETIC POLE DURING THE YEAR OF MAXIMUM SOLAR ACTIVITY. Antarctic (Antarktika), 1971, p.122-156, TT 67-59071. Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 27 refs.

Results are presented from ionosphere sounding at Vostok during 1958, which was done with an automatic ionosonde and programmed in accordance with the specifications of the IGY manual. A graph shows the daily variations in f0F2, f0F1, f0E, and f min, and their minimum virtual heights for the months of March, June, Sept., and Nov. at Thule and Vostok (near the North and South Geomagnetic Poles). A comparison is made of the daily f0F2 variation at 7 Antarctic stations for 1958; also, the average hourly values (universal time) for July 1958 at these stations are compared. The various irregular phenomena in the ionosphere are discussed. A graph shows the probability P of Es-appearance in the E layer over Vostok for 4 months in 1958. Seven types of Es are distinguished, and the behavior of type r (characterized by a lag in critical frequency) during auroras is described. Scattered reflections, the probability of which remains near 100 per cent all winter in the F2 layer, are shown. Anomalous increases in ionization of the F2 layer are correlated with ionospheric magnetic disturbances, solar flares, and Type IV radio bursts. For Russian original see K-4544.

K-11032
Webber, G.E. , Peden, I.C.
TECHNIQUE FOR DESCRIBING THE ANTARCTIC D REGION AT VLF BASED ON WAVEGUIDE DISPERSION MEASUREMENTS. Radio Science, June 1972 7(6) p.651-660, 21 refs.
QC851.R3

Average ionospheric reflection heights are deduced for a trans-Antarctic propagation path between Byrd Station and Scott Base. A technique is described for making relative phase measurements on VLF transmissions at several phase-locked frequencies. Results are interpreted using waveguide mode theory which accommodates a horizontal dipole source and the effect of an anisotropic polar ionosphere. Reflection heights are presented for illustration during a period of solar activity in Mar. 1969 and a quiet period in Sept. of the same year; correlations are made with other indicators of ionospheric activity.

K-11035
Potemra, T.A.
EMPIRICAL CONNECTION OF RIOMETER ABSORPTION TO SOLAR PROTONS DURING PCA EVENTS. Radio science, May 1972 7(5), p.571-577, 18 refs.
QC851.R3

Linear relationships between daytime 30 MHz polar-cap absorption and the square root of integral and differential proton fluxes have been studied experimentally, using satellite and riometer measurements, and theoretically, by means of power-law model proton spectrums together with D-region ionization models developed previously. Using data collected from the proton detectors on the polar-orbiting satellite 1963 38C on 93 passes and polar cap 30 MHz riometer data during three markedly different events, the best linear correlation was found. Daytime 30 MHz absorption during PCA's is affected most by 15 Mev protons, which produce their greatest ionization at a 65 km altitude in the D region. Satellite and riometer measurements from McMurdo Sound were used in the analysis.

K-11046
Petelski, E.F.
REAL HEIGHT VARIATIONS OF THE IONOSPHERIC F2-LAYER ABOVE SOME PAIRS OF GEOMAGNETICALLY CONJUGATE STATIONS. Journal of atmospheric and terrestrial physics, July 1972 34(7), p.1163-1170, 16 refs.
QC801.J6

It is usually assumed that electric potentials at geomagnetically conjugate points are balanced because of the high conductivity along the magnetic field lines. Therefore ionospheric movements caused by electric fields should be correlated at conjugate points. Subtracting wind generated movements from the observed total movements one should thus be able to estimate at what times and to what extent electric fields are effective in the ionosphere. For this purpose six pairs of conjugate stations are chosen, including Kerguelen-Sogra and Marion I.-Lindau. Real height variations of the F2-layer above these stations are deducted for magnetically quiet days in equinoctial and solsticial months. The experimental data is compared with theoretical results based on global wind theories. It appears that there do exist considerable electric fields which give rise to equivalent ionospheric height variations above closely conjugate points with equal declination effects.

K-11161
Wakai, N.
STUDY ON THE NIGHTTIME E REGION AND ITS EFFECTS ON THE RADIO WAVE PROPAGATION. Radio Research Laboratories. Journal, July 1971 18(98), p.245-347, 62 refs. Chapter 3, Ionospheric absorption in the nighttime as observed in field intensities of HF radio waves, contains a section on Measurement of HF field intensity on board ship for the Japanese Antarctic Research Expedition, p. 302-322
QC973.D43

The stratifications in the nighttime E region and their variations are investigated by the use of conventional and low frequency ionograms obtained at mid-latitudinal sounding stations. In the conventional ionograms, echoes, identified as reflections from the intermediate layer, can be detected only in geomagnetically disturbed conditions. From low frequency ionograms were derived nocturnal variations, solar activity dependence of the E layer at midnight, sunrise, and sunset hours, and electon concentration of the nighttime E layer. Field intensity of HF radio waves at different frequencies was measured during hours around

midnight on Japanese Antarctic Research Expedition voyages between Tokyo and Antarctica. Existence of the nighttime absorption is confirmed by the fact that the rate of decrease in field intensities against the ground range at a lower frequency is much larger than that at a higher frequency. Moreover, the dependence of absorption upon the solar activity is detected by measurement over ten years. Theoretical approaches are made to the propagation of MF and HF waves incident on model ionospheres in the nighttime by means of the ray-tracing technique.

K-11177
Siren, J.C.
DISPERSIVE AURORAL HISS. Nature physical science, Aug. 21, 1972 238(86), p.118-119. 5 refs.
Q1.N22

Reported are bursts of auroral hiss so brief as to have distinctly exhibited whistler-mode dispersion. The duration of each of these bursts was of the order of 0.1 s. These hisslers called "fast hisslers" to distinguish them from the more slowly varying, periodic hissler emissions reported by Carpenter et al (K-10693) and to indicate their kinship with auroral hiss were observed at a ground station. The data were received with a 32 km horizontal dipole antenna and recorded on magnetic tape at Byrd Station. If these bursts of auroral hiss are interpreted as having propagated along the field line passing through Byrd Station the location of their origin was between the geomagnetic equatorial plane and the receiver. Cerenkov radiation from precipitating auroral electrons, considered by J/rgensen (K-5986) to be a possible mechanism for the source of auroral hiss, cannot be excluded as a possible source mechanism for fast hisslers on the basis of intensity alone. The fast hisslers, however, have a broader bandwidth than would be predicted by J/rgensen's model.

K-11178
Barcus, J.R.
CONJUGATE FEATURES OF MAGNETOSPHERIC ELECTRON DYNAMICS OBSERVED AT BALLOON ALTITUDES. Space science reviews, June 1972 13(2), p.295-312, 15 refs.
QB1.S77

Analysis of recent observations from balloon flights over Byrd Station, Antarctica and Hudson Bay, Canada, and from spacecraft and surface observatories demonstrate regional, shell, and nearpoint conjugacy at L ~ 7 during precipitative events which were characterized by local acceleration as well as release of gradient-drifted electrons injected during substorms. A number of new features of magnetospheric dynamics relating to substorm development and sudden-commencement effects, have been brought to light which, though poorly understood at present, may prove of considerable importance and are worthy of further investigation. These are illustrated in some detail by four separate events, two in association with modest substorm activity in the nighttime magnetosphere, and two relating to sudden commencement geomagnetic storm effects observed in the morning section (midnight to noon).

K-11182
Gledhill, J.A.
SCIENTIFIC RESULTS OF THE SOUTH AFRICAN ANTARCTIC IONOSPHERE PROGRAMME 1962-1970. South African journal of antarctic research, 1971 No.1, p.3-10. 37 refs.

South African ionospheric studies are summarized, including the ionosphere at SANAE, the South Atlantic geomagnetic anomaly, the effects of charged particle precipitation in the region of the anomaly, the F-region at SANAE and electron precipitation, and the nature of F-region disturbances. The F2 region exhibited two unusual features: 1) the daily maximum of foF2, which normally occurs nearly at local noon at most stations, was reached at 06 local time at SNAAE during the summer months Nov.-Feb., and 2) large deviations of foF2 and h'F2 from median values are more frequent at SANAE than at any other station studied in the vinity of L=4. Conclusions are: 1) electrons are in fact precipitated into the F-region over a large part of the earth's surface; 2) the frequency of disturbance produced by this precipitation is about 30 per cent over most of the globe, between L values of 2-5; and 3) the frequency of electron flux precipitation producing such disturbances increases towards the center of the South Atlantic anomaly and reaches values in excess of 60 per cent in the middle of the anomalous region.

K-11184
Torr, M.R. , Torr, D.G.
BEHAVIOUR OF FOF2 AT SANAE. South African journal of antarctic research, 1971 No.1, p.16-21, 12 refs.

This paper presents a discussion of the solar cyclic, seasonal and diurnal variations as well as the day-to-day fluctuations of foF2 as observed at SANAE. The variations are described and little attempt is made to investigate their causes.

K-11185
Kuhn, G.J.
RELATIONSHIP BETWEEN RIOMETER ABSORPTION EVENTS OBSERVED AT DIFFERENT LATITUDES NEAR THE AURORAL OVAL. South African journal of antarctic research, 1971 No.1, p.22-23, 4 refs.

The possibility that particle precipitation in the auroral oval may in some way be connected with particle precipitation at lower latitudes inside the trapping region is investigated by making use of riometer absorption events observed at different latitudes near the auroral oval (SANAE at 59.7 deg invariant latitude and College at 64.6 deg). Events connected with particle precipitation at lower latitudes inside the trapping region (T-type events) do seem to be associated with events occurring in the auroral oval (A-type events). It is shown that the probability of finding a T-type event associated with an A-type event increases linearly with increasing magnetic activity, and that the magnitude (in decibels) of these T-type events also increases with increasing magnetic activity.

K-11186
Torr, M.R. , Torr, D.G.
OI AND N(2)+ EMISSIONS OBSERVED AT SANAE. South African journal of antarctic research, 1971 No.1, p.24-26, 24 refs.

The general behavior of the OI emissions at 6300 and 5577A, as well as the N(2)+ emission at 4278A, are discussed. The results concerning the twilight and midnight enhancements are reviewed. It is concluded that apart from the auroral enhancement near midnight due to the diurnal excursion of the auroral oval, there is a prevailing precipitation of soft electrons which may be related to the position of SANAE with regard to the southern radiation anomaly.

K-11187
Torr, M.R. , Torr, D.G.
EFFECTS OF A PARTIAL SOLAR ECLIPSE ON THE IONOSPHERE AT SANAE. South African journal of antarctic research, 1971 No.1, p.27-29, 3 refs.

A partial solar eclipse at SANAE is examined and a comprehensive version of the steady-state ionospheric continuity equation is solved for theoretical comparison. The results confirm previous conclusions, drawn from an analysis of eclipses at other stations, that it is impossible to reproduce the ionospheric eclipse effects satisfactorily if the only source of ionization used is solar EUV radiation. Part of the ionization appears to be unaffected by the eclipse and if a corpuscular source of ionization is included there is much better agreement between observation and theory than when it is not included.

K-11190
Wijk, A.M. van
GEOMAGNETIC SECULAR VARIATION AT THE SOUTH AFRICAN ANTARCTIC BASE, SANAE. South African journal of antarctic research, 1971 No.1, p.34, ref.

Tabular and graphical data showing the mean annual values of the geomagnetic elements as observed by successive South African Antarctic Expeditions during their occupation of the Antarctic stations Norway (1960-1961) and SANAE (1962-1969) are presented. Attempts made by successive observers to obtain a direct tie-in between the 'absolute' magnetic stations at Norway and SANAE Stations gave disappointingly inconsistent results. However, the differences, if any, between the absolute values at the two stations can be read off with reasonable accuracy from gamma intensity charts which are illustrated. Interesting features of the graphs are the almost negligible differences in the intensity elements at Norway and SANAE Stations at the time of the change-over in 1962, and the downward trend in the D curve since 1965.

K-11192
Kuhn, G.J.
GEOMAGNETISM AND AURORA PROGRAMME IN ANTARCTICA. South African journal of antarctic research, 1971 No.1, p.36

The aurora program in Antarctica consists of an all-sky camera recording of aurorae, supplemented by visual observations. The camera makes recording on 35-mm black and white film and normally runs on a 15 min program. The records are analyzed and tabulated as hourly auroral plots. Continuous recording of the magnetic field elements H, Z, and D is done on a La Cour storm magnetograph and on a 3-Axis Kelvin Hughes Fluxgate magnetometer. Absolute observations of the magnetic elements are made regularly to maintain base-line control and to establish the secular-change rates of the magnetic field elements. The instruments which are at present used for the absolute observations are: quartz horizontal-force magnetometers (QHM) for determining the horizontal intensity and declination; a magnetometric zero balance (BMZ) for determining the vertical intensity; a fibre declinometer for determining the declination; and an Elsec proton precession magnetometer for determining the total field intensity.

K-11208
Mansurov, S.M. , Mansurova, L.G.
RELATIONSHIP BETWEEN THE MAGNETIC FIELDS OF SPACE AND OF THE EARTH. Geomagnetism and aeronomy, July 1971 11(1), p.92-94, Translation from Geomagnetizm i aeronomiia, 11(1):115-118, 1971. 10 refs.
QC811.G383

On the basis of geomagnetic data obtained from 7 stations in the Northern and 11 stations (including Vostok and Dumont d'Urville Stations) in the Southern Hemisphere the morphology of the effect produced in the geomagnetic field by the sector structure of the interplanetary magnetic field is described. Estimates are given of the diurnal and seasonal variations of this effect. It is shown that geomagnetic field variations in the polar caps, associated with this effect, can be roughly approximated by zonal electric-current systems. The direction of the current is opposite in the Northern and Southern Hemispheres and depends on the direction of the interplanetary magnetic field. Two associated types of geomagnetic variations in the polar caps are found, and their classification is given.

K-11209
Al'tshuler, L.I. , Anshukova, T.N., Kunina, N.V., Mal'tseva, K.A., Medvedeva, T.E., Privalova, L.A., Shliakhtina, A.P., Chugurian, Z.S.
GLOBAL MAGNETIC CHARTS OF THE 1965 EPOCH. Geomagnetism and aeronomy, July 1971 11(1), p.107-113, Translation from Geomagnetizm i aeronomiia, 11(1):133-143, 1971. 9 refs.
QC811.G383

Global geomagnetic charts of the 1965 epoch constructed on the basis of extensive up-to-date material are presented for seven elements: declination D, inclination I, geomagnetic field intensity T and its components: horizontal, H, vertical Z, northern X, and eastern Y. Three types of surveys done mostly by the USSR, US and Canada were used to construct the charts: aeromagnetic, marine and ground surveys. Because of the insufficiency of data, the accuracy of the charts in the Southern Hemisphere is much lower than in the Northern. The coordinates of the Magnetic Poles were determined as 75.1N and 100.8W for the North, and 67.5S and 140.0E for the South Magnetic Pole.

K-11216
Lobodin, T.V.
RELATIONSHIP OF THE INTENSITY OF THE ELECTRIC FIELD OF THE ATMOSPHERE WITH POLAR AURORAE. Geophysical bulletin, 1966 No.13, p.42-44, Translated from Geofizicheskii biulleten' No. 13:38-40, 1963. 10 refs.

Electric field strength E of the atmosphere was recorded by an electrostatic fluxmeter with continuous recording by an electronic potentiometer at Mirnyy Station in 1958. Data on changes of electric field strength during auroras were obtained during 81 continuous hours of observation. Auroras behave as a positive volume charge in the Southern Hemisphere and as a negative volume charge in the Northern Hemisphere. It is noted that correction must be introduced for the diurnal unitary variation. At Mirnyy the maximum unitary variation approximately coincides with the maximum frequency of occurrence of auroras. The correction for unitary variation is about 60 per cent of the change of E. For Russian original see K-1325.

K-11261
Rothmuller, I.J. , Beer, T.
CONJUGATE POINT PHENOMENA. Science progress, 1972 60(238), p.205-215, 36 refs.

Magnetospheric and ionospheric manifestations of conjugate point phenomena are reviewed, including aurora, whistlers and other VLF emissions, micropulsations, and magnetic variations such as magnetic bays and polar substorms. The conjugate sites used in the study include Macquarie I., Campbell I., Scott Base, Byrd Station, South Pole, and Eights Station. It is demonstrated that the kinds of processes which can be explained by conjugate studies are measured via secondary effects. Thus, a great amount of data is necessary.

K-11272
Hirasawa, T. , Nagata, T.
CONSTITUTION OF POLAR SUBSTORM AND ASSOCIATED PHENOMENA IN THE SOUTHERN POLAR REGION. Japanese Antarctic Research Expedition. Scientific reports, Mar. 1972 Ser. A: Aeronomy, No.10, 75p., 48 refs.

With the aid of a quick-scan auroral photometer designed for investigating the time and space variations of auroral luminosity, more than 300 clear night hours of data were recorded at Showa Station. The following problems were studied: (1) space and time variation of auroral displays, (2) magnetic field variations associated with the space-time auroral displays, (3) relationships among auroras, magnetic field disturbance, magnetic pulsations, VLF hiss, VLF chorus and CNA during the course of substorms. Various kinds of morphological evidence obtained through the above investigations show that a polar substorm consists of the breakup phase and the post-breakup phase. The breakup phase is characterized by a sudden intensification of auroral arc(s) or band(s) and a rapid poleward movement of the intensified aurora(s) with speed of about 1 km/s (breakup type aurora). The post-breakup phase is defined as diffused auroras or rays which still remain after the intense breakup type aurora(s) have passed away polewards (post-breakup type aurora). Generally, the post-breakup aurora(s) move towards the equator side.

K-11333
Brown, R.R. , Leinbach, H., Akasofu, S.-I., Schmidt, R.J., Daiatsky, V.M.
QUADRUPLE CONJUGATE PAIR OBSERVATIONS OF THE SUDDEN COMMENCEMENT ABSORPTION EVENT ON JUNE 17, 1965. Journal of geophysical research, Oct. 1, 1972 77(28), p.5602-5607, 10 refs.
QC811.J6

Sudden commencement absorption at 2144 UT, June 17, 1965, was observed with two groups of conjugate riometers separated by approximately 100 deg in magnetic longitude. The riometer sites included Kotzebue, Alaska-Macquarie I., Australia; Farewell, Alaska-Campbell I., New Zealand; Great Whale River, Canada-Byrd Station, Antarctica; and Baie St. Paul, Canada-Eights, Antarctica. The location of the region of maximum precipitation occurred in the local afternoon hours. From closely spaced riometers in midnight sector, evidence is presented indicating that the triggering of magnetospheric substorms by sudden commencements is highly structured.

K-11335
Montgomery, G.E.
AEROMAGNETIC STUDY OF PART OF THE ROSS ISLAND AND TAYLOR GLACIER QUADRANGLES, ANTARCTICA. Dekalb, Northern Illinois University, 1972, 49p., Master's thesis. 63 refs.

High gradient magnetic anomalies in the Dry Valley Area are caused by Jurassic dolerite sills in the uplands which are more resistant to erosion than the country rock. Low magnetic relief is associated with the Precambrian to Ordovician basement complex which has a large surface exposure along the coast and in the lower reaches of the valleys. Late Tertiary and Quaternary volcanics are the source for localized, steep magnetic gradients over the Dailey Is. and for the complex magnetic features observed over Ross. I. Mt. Erebus is associated with a single magnetic high whereas Mt. Bird is associated with multiple anomalies which may indicate multiple vents. A broad magnetic high located over McMurdo Sound southwest of Ross I. is produced by a body which is 23 km wide lying 5 km below sea level. This broad anomaly is in line with the volcanics of Ross. I. and Mt. Discovery and may indicate the deep-seated intrusive source of the McMurdo volcanics. (Auth.)

K-11343
Murayama, M. , Kusunoki, K., Kawaguchi, S.
JAPANESE SOUNDING ROCKET PROGRAMME AT SYOWA STATION, ANTARCTICA. Antarctic record, March 1972 No.43, p.1-7, 4 refs.

The sounding rocket program at Showa Station was proposed by the National Antarctic Committee of the Science Council of Japan. The Polar Research Center, National Science Museum, has taken the responsibility for detailed planning, with the cooperation of other organizations concerned. The rocket range at Showa Station was inaugurated in Jan. 1969. Three buildings were erected, namely, a control center, a telemetry station, and a rocket assembly shop. Two kinds of rockets, S-160 (peak altitude about 90 km) and S-210 (about 120 km), were selected to be used in the initial stage of the research program. In Jan. 1970, a launcher was connected with the assembly shop and necessary equipment was installed for the first test launching of S-160. In Feb. 1970, two test flights for measuring electron density and ozone concentration were successfully accomplished, reaching to an altitude of about 90 km. Future plans for launching six S-210 and one S-160 in the austral winter of 1971 and 1972 are described. (Auth. mod.)

K-11348
Matuura, N.
DYNAMICS ON POLAR IONOSPHERE. Antarctic record, March 1972 No.43, p.42-45, In Japanese with English summary. 15 refs.

Future projects for Antarctic rocket observations are discussed with regard to two dynamical problems on the polar upper atmosphere and the polar ionosphere. One is the dynamical effects on seasonal variations of the structure of the polar upper atmosphere and polar ionosphere, and the other is the upper atmospheric motions associated with polar substorms. (Auth.)

K-11349
Matsumoto, H. , Kimura, I.
COMMENTS ON PLASMA WAVE EXPERIMENTS BY SOUNDING ROCKETS IN THE ANTARCTICA. Antarctic record, March 1972 No.43, p.46-52, In Japanese with English summary. 2 refs.

As a part of the proceedings of a Symposium on future planning of rocket observation at Antarctica, problems of the rocket experiments on plasma wave phenomena are briefly discussed. Engineering requirements for the rocket experiments of the wave phenomena in the future

are first described and then scientific missions of plasma wave observations and experiments at Antarctica are discussed. (Auth.)

K-11350
Oya, H.
EFFECTS OF MAGNETOSPHERIC PLASMA ON AURORAL SUBSTORM. Antarctic record, March 1972 No.43, p.53-59, In Japanese with English summary. 13 refs.

A recommendation on scientific objectives of the polar rocket measurements is presented with respect to studies on the relationship between the magnetospheric plasma and the aurora breakup stages or substorms. The qualitative consideration on the wave-particle interaction in a turbulence involving the plasma instability and nonlinear interactions suggests a possibility of energetic aurora particle production in the magnetospheric plasma. This should be investigated quantitatively using a correlated observation system established between the polar rockets and the orbiting satellites in the magnetosphere. Conventional parameters, which describe the aurora and the substorm, such as the magnetic field, particle energy spectrum, electron density and photo-chemical productions, should also be measured by the rockets, while the electric field spectrum in the turbulent plasma will be measured by the satellites being correlated with the energetic particle spectrum in the magnetosphere. (Auth.)

K-11351
Iijima, T.
SOME COMMENTS ON THE AURORAL-ELECTROJET FORMATION. Antarctic record, March 1972 No.43, p.60-64, In Japanese with English summary. 3 refs.

The essence of the auroral-electrojet is an association with the rapid motion of the aurora. The three-dimensional current distribution is estimated based on the change of 4278 A line aurora observed at Showa Station by Hirasawa (1971). The auroral luminosity change (the local change plus the change due to the movement) implies the disturbance in the ionosphere electron density distribution over the auroral oval, which is directly associated with the field-aligned current. The ionosphere and magnetosphere electric field is eventually strained and results in the westward ionosphere current asymmetric with respect to the center of the arc (intense in the poleward side and weak in the equatorward side) presumable for the observed delta H distribution over the auroral oval.

K-11352
Saito, T.
SOME TOPICS FOR THE STUDY OF THE MECHANISM OF MAGNETOSPHERIC SUBSTORM BY MEANS OF ROCKET OBSERVATION IN THE AURORAL ZONE. Antarctic record, March 1972 No.43, p.65-79, 25 refs.

Some of the problems associated with polar substorms which are expected to be solved by means of low-altitude rocket observations at Showa Station are discussed, mainly from the viewpoint of the ULF or geomagnetic pulsation substorm. The pulsations associated directly with magnetospheric substorms are classified into only two subclasses, Pi 1 and Pi 2. Of the subclasses of Pi's, Pid and Ps 6 pulsations are particularly suitable for further study because both seem to be related to important characteristics of polar substorms: Pid to the magnetospheric tsunami and Ps 6 to the field-aligned current. The main features of Pid and Ps 6 pulsations are examined.

K-11353
Kaneda, E.
ROCKET OBSERVATION OF AURORA. Antarctic record, March 1972 No.43, p.80-82, In Japanese with English summary. 6 refs.

After a brief comment on the recent progress in the morphological study of substorms, it is stated that rocket observations must be conducted in connection with the study of synoptic auroral features. The observation of O2 infrared atmospheric (0,0) 1.27 mu is especially important as a target of synthetic researches on magneto-ionospheric coupling. Finally, aurora monitoring at rocket position by an automatic TV camera is recommended as an enhanced ground observation during the flight. (Auth.)

K-11354
Kamiyama, H.
IONOSPHERE PRODUCED BY THE IMPACT OF 1 KEV-ELECTRONS. Antarctic record, March 1972 No43, p.83-85, In Japanese with English summary. 2 refs.

This short note describes the ionospheric effect of 1 keV-electrons incoming possibly from the magnetotail. The rate of the ionization produced through the impact of these electrons is calculated as a function of altitude, and the maximum is found to be 1850/cu cm/s at the altitude of 154 km for the isotropic incidence of a flux of 100,000,000/sq cm/s/ster. The lifetime of the ionization is estimated to be about 43 min for the F2 peak, while the lower layer will fade out shortly after the electron precipitation ceases.

K-11382
Helliwell, R.A.
VLF NOISE OF MAGNETOSPHERIC ORIGIN. Stanford University, [1967?], 13p., Unpublished manuscript. 45 refs.

Progress in the study of VLF emissions during 1963-1965 is reviewed under three main headings: ground-based observations, rocket and satellite observations, and theories. The VLF emissions considered are found principally in the range 100 to 30,000 cps and appear to originate in the ionosphere and magnetosphere. Ground-based observations included periodic emissions, discrete emissions, aurora-associated hiss, and quasi-periodic emissions. Satellite observations revealed an unusual band of noise that is frequently stimulated by whistlers and is apparently related to the lower hybrid resonance frequency. Theoretical work confirmed the inadequacy of known single particle radiation mechanisms to explain the observed intensities of VLF emissions. The precipitation of energetic particles was theoretically linked to the generation of VLF emissions.

K-11383
Helliwell, R.A.
MEASUREMENT OF VLF AND ASSOCIATED ELF, LF AND HF PHENOMENA USING SATELLITE AND GROUND-BASED FACILITIES IN THE ANTARCTIC. Stanford University, Apr. 22, 1968, 15p., Unpublished manuscript. 17 refs.

Recent results of VLF studies at Byrd, Eights, and Plateau Stations are reviewed. Among major new results in studies of the plasmapause is the detection of plasmapause crossings on the Alouette satellites and a comparison of these

crossing data with simultaneous ground measurements of the plasmapause at Eights and Byrd. Other studies in progress include the distribution of thermal electrons along the field lines in the plasmasphere; work on the thermal plasma; hydromagnetic drift motions and the detection of the quasi-static electric field in the magnetosphere; the upper intensity cutoff of whistlers and associated half-gyrofrequency triggering by whistlers and controlled sources; and detailed relationships between aurora and VLF-LF noise at Plateau Station.

K-11393
Coxell, H. , Fairchild, W.W., Pomerantz, M.A.
SCINTILLATOR MESON TELESCOPE FOR STUDIES OF COSMIC RAY INTENSITIES. Swarthmore, Bartol Research Foundation, [1965?]. 41p., 11 refs.

A meson telescope utilizing plastic scintillator detectors and capable of a counting rate exceeding 1,000,000 counts per hour is described. The design considerations and operating characteristics of this type of instrument are discussed. A brief description of a more compact instrument suitable for airborne observations is included. Meson telescopes of the type described have been operating satisfactorily at Thule, Greenland, and McMurdo Sound, Antarctica. An additional unit has been installed aboard the Eltanin as part of the U.S. Antarctic Research Program. (Auth. mod.)

K-11394
VISUAL AURORA. VOLUME 9. ZONE. Ithaca, Cornell University, 1967, 39p., 33 refs.

The objective of this volume is to present a rapid digest of auroral data which can be used to locate any type of zone desired. The first step is to give the location of the points where auroras are most likely to be seen in each hemisphere for each of the ten values of the planetary magnetic index K. An estimate of the diurnal variation is also given for each hemisphere. The next step gives some descriptions of the data from various stations and shows how they compare with the general zones shown. This shows areas where more data are needed, and indicates the type of data to be sought when going into unexplored areas. The final section of the volume shows some methods of using these data. A short bibliography is attached. Antarctic data are included.

K-11403
AURORA AUSTRALIS. La aurora austral. Buenos Aires. Instituto Antartico Argentino. Boletin, Nov. 1965 2(18), p.3-7, In Spanish.

General comments on incidence, visual appearance, and types of aurora in Antarctica are made. The international aurora classification system is given with drawings of each type and certain forms are illustrated with photographs. The work of the Instituto Antartico Argentino, the only Latinamerican institute investigating the southern aurora, is described. A full-sky camera is in use at General Belgrano Station and visual observations are being made from Sobral Station.

K-11410
Bell, T.F.
WAVE PARTICLE GYRORESONANCE INTERACTIONS IN THE EARTH'S OUTER IONOSPHERE. Stanford University. Stanford Electronics Laboratories. Report, May 1964 SU-SEL-64-063, U.S. Air Force Office of Scientific Research. Technical report No.3412-5, 193p., AD 607 379, 169 refs.

The gyroresonance interactions which take place between very low frequency VLF electromagnetic waves and charged particle fluxes in the earth's outer ionosphere are thought to be of importance with respect to the dynamical properties of the earth's outer ionosphere. One problem involves the stability of the outer ionosphere plasma to whistler-mode waves under conditions in which high energy electron fluxes permeate this plasma. A second problem involves the feasibility of the creation or depletion of an artificial radiation belt utilizing the geocyclotron gyroresonance interaction in order to transfer energy between man-made waves and relativistic electrons trapped in the outer ionosphere by the earth's magnetic field near the magnetic equatorial plane. It is concluded that the geocyclotron interaction may possibly represent a positive method of control of natural and artificial radiation belts. Examples of artificially triggered-VLF emissions, among others, were recorded during synoptic-recording schedules on the Eltanin off Palmer Peninsula, and associated with Morse-code transmissions from Cutler, Maine. Examples are also given of frequency-time characteristics of hiss as recorded at Byrd Station.

K-11427
Barcus, J.R. , Brown, R.R., Karas, R.H., Rosenberg, T.J., Trefall, H., Bronstad, K., Kodama, M.
AURORAL X-RAY AND CONJUGATE IONOSPHERIC ABSORPTION OBSERVATIONS OF AN ELECTRON PRECIPITATION EVENT ACCOMPANYING A SUDDEN IMPULSE IN THE GEOMAGNETIC FIELD. Journal of geophysical research, Nov. 1, 1972 77(31), p.6294-6297, 9 refs.
QC811.J6

Only one example has been reported in the literature (Brown, 1967) of a sudden impulse (si) in association with auroral-zone electron precipitation. This letter deals with a second example of si electron precipitation in the auroral zone occurring on Feb. 4, 1969. The observations were obtained near the dawn meridian and include both bremsstrahlung data at balloon altitude and ionospheric absorption of cosmic radio noise. This event, in contrast with that reported previously, shows rapid variations in the electron flux; in addition, riometer observations at conjugate sites (Reykjavik, Iceland, and Showa, Antarctica) show that the electron precipitation was essentially similar and simultaneous at this longitude.

K-11432
Vernov, S.N. , Charakhch'ian, A.N., Charakhch'ian, T.N., Stozhkov, IU.I.
RESULTS OF SIMULTANEOUS MEASUREMENTS OF THE COSMIC-RAY INTENSITY OVER THE ANTARCTIC AND ARCTIC. Canadian journal of physics, May 15, 1968 46(10/4), p.S823-S824, 2 refs.
QC1.N332

The results of an analysis of data obtained from measurements carried out by means of regular stratospheric launchings of cosmic-ray radiosondes over the Murmansk region and at Mirnyy Station in 1963-66 are presented. The problem of the anisotropy of the primary component of low-energy cosmic rays and of temperature effects on the cosmic-ray intensity in the atmosphere are discussed. (Auth.)

K-11433
Charakhch'ian, A.N. , Charakhch'ian, T.N.
ELEVEN-YEAR MODULATION OF GALACTIC COSMIC RAYS IN INTERPLANETARY SPACE. Canadian journal of physics, May 15, 1968 46(10/4), p.S879-S882, 7 refs.
QC1.N332

Daily balloon measurements of the cosmic-ray intensity in the stratosphere which have been carried out since 1957 in the USSR and since 1962 over the Antarctic have made it possible to obtain practically continuous information on the level of the cosmic-ray intensity in the stratosphere. Almost the whole increase in the cosmic-ray intensity during the period of decreasing solar activity (1960-64) was composed of a number of individual events occurring at intervals of 6-12 months. This phenomenon is almost entirely due to the corresponding decrease of solar activity. When solar activity decreases, the cosmic-ray intensity gradually increases to reach a stationary level over a period of about two months. Results obtained on large-scale magnetic "clouds" which modulate galactic cosmic rays in interplanetary space are discussed in terms of the diffusion theory of 11-year modulation.

K-11434
Shea, M.A. , Smart, D.F., McCall, J.R.
FIVE DEGREE BY FIFTEEN DEGREE WORLD GRID OF TRAJECTORY-DETERMINED VERTICAL CUTOFF RIGIDITIES. Canadian journal of physics, May 15, 1968 46(10/4), p.S1098-S1101, 6 refs.
QC1.N332

Vertical cutoff rigidities have been calculated for a world grid, including the Antarctic region, 5 degrees in latitude and 15 degrees in longitude using the Finch and Leaton sixth-degree simulation of the quiescent geomagnetic field. These calculations utilized the trajectory-tracing procedure at intervals of 0.01 BV throughout the penumbral region to determine an "effective" vertical cutoff rigidity defined by Shea et al. (1965). When experimental cosmic-ray intensity data are plotted using threshold rigidities derived from this grid, greater coherence of these data is found than is obtained using previously published threshold values. However, small deviations from an intuitively pleasing smooth curve indicate we may have reached a limitation in the usefulness of vertical cutoff rigidities, and perhaps second-order effects should be included when using cutoff rigidity as a parameter in the analysis of very precise cosmic-radiation intensity data. (Auth.)

K-11447
Vernov, S.N. , Charakhch'ian, A.N., Stozhkov, IU.I., Charakhch'ian, T.N.
MEASUREMENTS OF THE COSMIC-RAY INTENSITY IN THE STRATOSPHERE MADE BY SOVIET ANTARCTIC EXPEDITIONS. Stratosfernye izmereniia intensivnosti kosmicheskikh luchei sovetskimi antarkticheskimi ekspeditsiiami. Antarktika; doklady komissii, 1969, pub. 1971, p.5-15, In Russian. 13 refs.
G576.A65

A comparison of data on the cosmic-ray intensity obtained from radiosondes over the Arctic (Olenya Station) and the Antarctic (Mirnyy Station) from 1963 to 1969 during the winter-summer periods shows that the temperature effects on cosmic rays in the stratosphere are very slight, and the temperature coefficient is negative, amounting to -0.05 per cent per degree in an atmospheric pressure range of 10-250 g/sq cm. An asymmetry in the cosmic-ray intensity in the Northern and Southern Hemispheres was found. Galactic cosmic rays in interplanetary space and solar cosmic rays during solar flares are basically isotropic.

K-11448
Stozhkov, IU.I. , Charakhch'ian, A.N.
LATITUDINAL MEASUREMENTS OF THE COSMIC-RAY INTENSITY IN THE STRATOSPHERE. Shirotnye izmereniia intensivnosti kosmicheskikh luchei v stratosfere. Antarktika; doklady komissii, 1969, pub. 1971, p.16-30, In Russian. 9 refs.
G576.A65

Results are given of latitudinal measurements of the cosmic-ray intensity in the stratosphere made from Soviet ships in the Northern and Southern Hemispheres during solar minimum (1964) and solar maximum (Dec. 1968--Feb. 1969). The experimental data obtained can be used for checking calculations of the geomagnetic cutoff thresholds in various models of the Earth's magnetic field. The data agree well with values of geomagnetic cutoff thresholds, estimated by a method of numerical integration of the equation for the movement of the charged particles in the Earth's magnetic field, which also includes non-dipole terms of the field. On the basis of the data, the coupling factors for a period of maximum solar activity were calculated.

K-11449
Kolomiitsev, O.P.
ROLE OF IONIZED PARTICLE TRANSFER IN THE FORMATION AND MAINTENANCE OF THE IONOSPHERIC F2-LAYER AT HIGH LATITUDES. O roli perenosa ionizirovannykh chastits v obrazovanii i podderzhanii sloia F2 ionosfery vysokikh shirot. Antarktika; doklady komissii, 1969, pub. 1971, p.31-41, In Russian. 70 refs.
G576.A65

On the basis of the latest theoretical aspects and experimental data, a process of ion transfer in the upper ionosphere and its role in the formation and maintenance of the F2-layer in antarctic regions are discussed. It is concluded that the ion fluxes from the protonosphere cannot be a primary source for the maintenance of the night F2-layer in the polar region. To explain the occurrence and features of the ionosphere in the polar regions during polar nights, it is suggested to measure the concentrations of atomic hydrogen ions and neutrons at high latitudes and heights of about 500 km and up, and to study other sources of ionization or other physical processes.

K-11464
Tulunay, Y.K.
MAGNETICALLY SYMMETRIC DETECTION OF THE MID-LATITUDE ELECTRON DENSITY TROUGH BY ARIEL 3 SATELLITE. Journal of atmospheric and terrestrial physics, Sept. 1972 34(9), p.1547-1551, 4 refs.
QC801.J6

Magnetic shell alignment of the mid-latitude electron density trough has been investigated by using the data returned by Ariel 3 satellite. The low-latitude boundaries of the troughs in the northern and southern hemispheres are more precisely aligned on the same magnetic shell than are the trough minima.

K-11466
Lanzerotti, L.J. , Lie, H.P., Tartaglia, N.A.
IONOSPHERIC EFFECTS ON THE TRANSMISSION OF ULTRALOW-FREQUENCY PLASMA WAVES. Science, Nov. 3, 1972 178(4060), p.499-502, 17 refs.

Q1.S35

Measurements of magnetospheric ULF plasma waves on the ground under continuous daylight conditions in the Antarctic and under alternate day-night solar illumination at the conjugate station in Quebec indicate a significant local time dependence in the transmission properties of the ionosphere for waves of these periods. When the Antarctic station is compared with the Quebec station, the tilt (with respect to the ionosphere) of the orientation plane of the waves is observed to be larger at local noon than at local night. (Auth.)

K-11483

Fehrenback, M. , Roldugin, V.K.

AURORA OF MARCH 8, 1970 AT KERGUELEN AND SOGRA. L'aurore du 8 mars 1970 a Kerguelen et Sogra. Annales de geophysique, 1972 28(2), p.473, In French.

Kerguelen and Sogra have been equipped with identical photometers, technical details of which are given. The intensity of the aurora of March 8, 1970 is given graphically, showing that it was much greater at Sogra. Clouds which prevented photographic measurement did not affect the photometer.

K-11484

Maryland. University

FINAL REPORT. NATIONAL SCIENCE FOUNDATION GRANT GA-48. College Park, University of Maryland, 1965, 7p., 5 refs.

A large scintillator was in operation from 1960 to 1964 for cosmic ray research at Hallett Station. The scintillator detector had a high counting rate and was used in conjunction with a standard IGY neutron monitor. Theoretical research focusing on interplanetary modulation of cosmic rays, which was conducted along with the data collection program, is described. An interpretation of transient decreases in galactic cosmic radiation intensity was proposed based on the assumption that magnetized solar plasma is magnetically turbulent and undergoes expansion during transit from sun to earth. This theoretical research continues despite termination of the data collection program.

K-11487

Webber, G.E. , Peden, I.C.

THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE ANTARCTIC EARTH-IONOSPHERE WAVEGUIDE AT VERY LOW FREQUENCIES. Washington (State) University. Department of Electrical Engineering. Technical report, March 1972 No.154, 188p., Available from University Microfilms, Tyler Green, London. 52 refs.

The Antarctic polar waveguide is analyzed. A unique theoretical and experimental approach for describing the electrical properties of the lower boundary of the waveguide and ultimately relating these to the reflection coefficients for incident waveguide modes is given. A theoretical investigation is then made of the VLF fields excited by a horizontal dipole in the presence of an ice-covered ground and an anisotropic ionosphere. The analysis is generalized to accomodate height gradients in the ionosphere. Numerical results are presented which describe the excitation, propagation and polarization of radiated energy for ionospheres during summer and winter. Finally, an experimental technique for describing average VLF reflection heights in the lower ionospheric D region is developed and measured results for 1969 are given and correlated with data simultaneously recorded by other investigators.

K-11495

Stelling, C.

RIOMETER IONOSPHERIC SOUNDINGS. BASE ROI BAUDOUIN, FEBRUARY 1966 TO JANUARY 1967. Sondages ionospheriques riometre. Base Roi Baudouin, fevrier 1966 a fevrier 1967. Bruxelles, Exantar, 1970, 348p., In French with preface in French, English, and Flemish.

Tabulated hourly values of ionospheric data collected by the Belgian-Netherlands Antarctic Expedition at Roi Baudouin Station in 1966 are given. Data tabulations are prefaced with information on instruments used, procedures, type of data obtained, precision, and a list of descriptive symbols. The report is part of a continuing program.

K-11514

Morozov, E.E. , Sen'ko, P.K.

RESULTS OF GEOMAGNETIC OBSERVATIONS ALONG THE MOLODEZHNAYA-POLE OF INACCESSIBILITY-NOVOLAZAREVSKAYA PROFILE. Rezul'taty geomagnitnykh nabliudenii po marshrutu Molodezhnaia-Polius Nedostupnosti-Novolazarevskaia. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.54, p.263-268, In Russian.

G860.S63

The geomagnetic field components and their secular variations were studied by the 12th Soviet Antarctic Expedition during a tractor-sled train operation along the Molodezhnaya-Pole of Inaccessibility- Novolazarevskaya traverses. The instruments used for geomagnetic observations are discussed. Tabulated are data on the values of declination (D), and horizontal (H) and vertical (Z) intensities of the earth's magnetic field.

K-11539

Soond, R.T.

PLATEAU STATION REPORT - GEOMAGNETISM DIVISION, NOV. 16, 1967 - JAN. 26, 1969. Rockville, U.S. Coast and Geodetic Survey, 20p., Unpublished manuscript.

The activities performed by the geomagnetism program observer for the U.S. Coast and Geodetic Survey at Plateau Station from Nov. 16, 1967 to Jan. 26, 1969 are discussed with emphasis on operating procedures and problems with instruments. Data results are not included. It is suggested that the equipment would be more reliable if modified to include forced air cooling with effective filters to correct the problems caused by soot and reduced air density at the 11,890 foot high station. The reason for correlation between severe temperature drops in the variations hut during hut power failure and convergence of normal magnetogram traces should be determined. Greater care should be taken to insure a supply of spare parts and sufficient electronic knowledge on the part of the observer to enable him to repair equipment.

K-11548

Grenhill, J.G. , Fenton, K.B., Fenton, A.G., White, K.S.

12.5-MINUTE PERIODICITY IN SOLAR PROTON FLUXES AT BALLOON ALTITUDE AND IN MAGNETIC MICROPULSATIONS. Journal of geophysical research, Dec.1, 1972 77(34), p.6656-6664, 19 refs.

QC811.J6

Quasi-periodic 12.5-min fluctuations occurred in the counting rates of Geiger counters

and a neutron counter during level flight of a balloon over Wilkes, Antarctica, on September 3, 1966. Correlated fluctuations were observed in the Wilkes magnetometer record. A large solar cosmic-ray event was in progress at the time of the flight. The periodic modulation process is shown to have an energy dependence with a peak at about 50 Mev for solar protons. No periodicity was detected in the Geiger counter telescope rate, which had a proton threshold energy of 110 Mev. It is suggested that the modulation is a result of scattering by hydromagnetic waves in the distant part of the tail. The protons with E 110 Mev did not pass through the modulating region and probably gained access to the magnetosphere on the dayside. (Auth.)

K-11549
Lanzerotti, L.J. , Hasegawa, A., Tartaglia, N.A.
MORPHOLOGY AND INTERPRETATION OF MAGNETOSPHERIC PLASMA WAVES AT CONJUGATE POINTS DURING DECEMBER SOLSTICE. Journal of geophysical research, Dec.1, 1972 77(34), p.6731-6745, 45 refs.
QC811.J6

The morphological characteristics of magnetospheric plasma waves detected at conjugate points (Lac Rebours and Siple Stations) near L = 4 during the winter solstice (from Dec. 14, 1970 to Jan. 24, 1971) are studied. No magnetospheric waves that satisfy an imposed strict selection criterion are observed after about 1700 LT. Approximately half the 94 accepted events are left-hand polarized. No significant change in the polarization characteristics of the waves is observed as a function of local time. Approximately 16 percent of the events have opposite polarizations in the two hemispheres. The morphological polarization characteristics are discussed in the context of expected body- and surface-wave polarizations. The observed polarizations do not readily support a surface wave arising from the Kelvin-Helmholtz instability on the magnetopause as a source for all the events. All but two of the left-hand and right-hand wave events were symmetrical about the meridian plane, implying a predominant in-phase oscillation of the H component of the wave at each station and an out-of-phase oscillation of the D component. (Auth., mod.)

K-11550
Mayr, H.G. , Volland, H.
THEORETICAL MODEL FOR THE LATITUDE DEPENDENCE OF THE THERMOSPHERIC ANNUAL AND SEMIANNUAL VARIATIONS. Journal of geophysical research, Dec.1, 1972 77(34), p.6774-6790, 30 refs.
QC811.J6

A three-dimensional model for the annual and semiannual variations of the thermosphere is presented in which the energy and diffusive mass transport associated with global circulation are considered in a self-consistent form. It is shown that these processes play a major role in thermosphere dynamics and thus account for a number of temperature and composition phenomena such as (1) the helium and oxygen bulges in the winter hemispheres at lower altitudes, (2) the relatively large temperature variations (26 percent) in the annual component, which exceed by a factor of 3 those temperatures inferred from the satellite drag data and would be much too large for a thermosphere in diffusive equilibrium, (3) the 7 percent variation of the exospheric temperature at the poles in the latitude dependent semiannual component associated there with a significant depletion of oxygen and helium during the equinox, and (4) the nearly height independent and relatively small amplitudes in the total mass density of the latitude dependent components that are responsible for the fact that the latitude variations of the semiannual effect have so far eluded observations from satellite drag data and that the globally uniform component of the semiannual effect appears to be relatively strong in comparison with the annual variations. (Auth.)

K-11551
Carpenter, D.L. , Akasofu, S.-I.
TWO SUBSTORM STUDIES OF RELATIONS BETWEEN WESTWARD ELECTRIC FIELDS IN THE OUTER PLASMASPHERE, AURORAL ACTIVITY, AND GEOMAGNETIC PERTURBATIONS. Journal of geophysical research, Dec.1, 1972 77(34), p.6854-6863, 16 refs.
QC811.J6

In two case studies of magnetospheric substorms, temporal variations of the westward component of the magnetospheric convection electric field in the outer plasmaphere were compared with auroral activity near L = 7 and with variations in the geomagnetic field at middle and high latitudes. The substorms occurred on July 29, 1965, near 0530 UT and on Aug. 20, 1965, near 0730 UT. The results on the westward electric field Ew were obtained by the whistler method with data from Eights, Antarctica (L approx. 4). All-sky camera records were obtained from Byrd, Antarctica (L approx. 7), located within about 1 hour of Eights in magnetic local time. It was found that Ew within the outer plasmasphere increased rapidly to substorm levels of approx. 0.5 mv/m about the time of auroral expansion at nearby longitudes. This behavior differs from results obtained from electrostatic probes on balloons, which show Ew reaching enhanced levels before the expansion. A close temporal relation was found between the rapid substorm-associated increases in Ew and a well-known type of nightside geomagnetic perturbation. (Auth., mod.)

K-11598
Katsufrakis, J.
VLF TRANSMITTING FACILITY FOR MAGNETOSPHERIC RESEARCH. Antarctic journal of the United States, July-Aug. 1972 7(4), p.118
G845.A56

This paper discusses the Siple Station transmitter and antenna constructed during the 1971-1972 austral summer. The transmitting antenna was designed to be a center-fed dipole resonant at 6 kHz. This frequency was chosen to match one-half of the minimum gyrofrequency for a magnetospheric field line path running through Siple Station. The antenna consists of No. 2AWG, strand seven-aluminum alloy wire supported above the ice on 300 each 2- by 5-inch aluminum channels placed every 200 feet. The antenna is oriented in a magnetic east-west direction and has a total length of 21.4 km. VLF receiving and recording systems at Roberval, Canada, (conjugate to Siple Station), will receive the transmissions.

K-11599
Lanzerotti, L.J. , Lie, H.P.
CONJUGATE MAGNETIC STUDIES NEAR L=4. Antarctic journal of the United States, July-Aug. 1972 7(4), p.118-120, 3 refs.
G845.A56

For correlative studies with the Siple magnetic data, three identical fluxgate magnetometer stations were operated in a latitudinal array in the Northern Hemisphere: Girardville, Quebec (L=4.5), Lac Rebours, Quebec (L=4), and Durham, N.H. (L=3.2). Data obtained during the 1970-1971 and 1971-1972 austral

summers are being used to study extensively the nature of the geomagnetic noise and magnetospheric waves generated near the average plasmapause position (L=4). Spectra for the field variations in all three components at 1400 local time and on the diurnal dependence of the total noise power and slope in the 8 to 512 second band for Siple and Lac Rebours Stations are shown graphically. The magnetic noise at the conjugate points showed a diurnal dependence with higher power intensities during local day at both conjugate stations.

K-11677
Helliwell, R.A.
MAGNETOSPHERIC RESEARCH IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.155-156
G845.A56

A barium cloud was released on Sept. 21, 1971 on the Byrd Station-Great Whale Station field line near the magnetic equator at a geocentric distance of approx 6 earth radii in order to observe the interaction of the ionized barium plasma with the ambient magnetospheric plama, drift motions, and interaction processes that might take place near the feet of the field line because of the cloud. VLF recordings were made at Great Whale, Byrd Station, and at Roberval, Canada. Estimates were made of electron density at the point of barium release and of the cross-L component of magnetospheric convection during and following the hour-long period of barium cloud observations.

K-11678
Wood, J.D.
NOAA GEOMAGNETIC OBSERVATORIES IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.156-157
G845.A56

The National Oceanic and Atmospheric Administration geomagnetic observatory operations were continued through the past year at Amundsen-Scott Station, but were terminated in Nov. 1971 at Byrd Station. Both stations operated Ruska magnetographs, photographically recording variations in declination and in the horizontal and vertical components of the earth's field. The data are used primarily to study the secular change rates and distribution patterns of the geomagnetic field and have been a major contribution to the U.S. national program in world magnetic chart compilation. They are made available through the World Data Center (WDC-A) for Geomagnetism.

K-11679
Hessler, V.P. , Heacock, R.R., Troitskaia, V.A.
MICROPULSATIONS AT THE GEOMAGNETIC POLES, 1971. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.157-158, 6 refs.
G845.A56

The three-component induction system at Vostok is operated cooperatively with Soviet scientists of the Arctic and Antarctic Scientific Research Inst., Leningrad, and joint analysis of the data is made with scientists of the Inst. of the Physics of the Earth, Moscow. A similar system at Thule (Qanaq), Greenland, is operated in conjunction with the scientific activities of the Danish Ionospheric Lab., Lyngby. Recording is by both strip chart and slow speed magnetic tape. In Feb.-Mar. 1971 the chart recorders at Vostok and Thule were run at 0.75 in per min as part of a global experiment on short period magnetic activity. Preliminary studies of wave polarizations for periodically structured type Pc 1 micropulsations recorded at Vostok in 1969-71 have been completed. The results are summarized.

K-11680
Vance, D.L.
U.S. EXCHANGE SCIENTISTS AT VOSTOK STATION, 1971. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.158
G845.A56

A brief account is given of some of the personal and scientific experiences of a U.S. exchange scientist at the Soviet Union's Vostok Station. Among the tasks performed were relocation of the micropulsation system for low noise operation, calibration of the ELF system, and antenna construction. Five programs were in operation throughout 1971: VLF hiss and whistler recording; riometers operating on 30 and 50 mHz; ELF three-component micropulsation systems; a two-component telluric current measurement system; and a single-component ULF system. Major polar cap absorption events occurred in Jan. and Sept. 1971.

K-11681
Akasofu, S.-I.
AURORAL OBSERVATIONS AT AMUNDSEN-SCOTT SOUTH POLE STATION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.158-159, 1 ref.
G845.A56

South Pole Station is in a unique location for monitoring the amount of magnetic flux transferred from the day sector of the magnetosphere to the magnetotail during magnetospheric substorms. In a series of all-sky photographs taken from the station on May 30, 1970 the equatorward advance and subsequent poleward retreat of a midday aurora is shown. Also illustrated is a midday aurora over South Pole on June 13, 1969 and the orbit of the ISIS-I satellite that crossed it.

K-11682
Stenbaek-Nielsen, H.C. , Wescott, E.M., Peterson, R.W.
AURORAL CONJUGACY. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.160-161, 3 refs.
G845.A56

Earlier work has indicated that pulsating auroras are conjugate. However, data from a series of conjugate flights over Alaska and south of New Zealand in Sept. 1971 indicate that different classes of pulsating auroras may exist, some of which display conjugacy and others which do not. All-sky camera data of auroral intensities at conjugate points show the typical features of the two auroral arc systems. The intensity variations in the equatorward arcs are well correlated, with the Alaskan auroras about 30 percent brighter than their conjugate counterparts. In the poleward arc system large uncorrelated variations appear, some of which may be explained by conjugate point wandering. Significant hemispherical and longitudinal differences in auroral morphology are indicated.

K-11683
Masley, A.J. , Baker, M.B., Satterblom, P.R.
SOLAR COSMIC RAY INVESTIGATIONS DURING 1971. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.161-162, 1 ref.
G845.A56

In 1971, eleven solar cosmic ray events

having greater than 0.4 decibel absorption at 30 mHz were observed. Solar cosmic rays in space were measured with instrumentation aboard two satellites -- the OGO-3 ionization chamber and the IMP-F (Explorer 34) proton spectrometer. Comparison of the measurements with simultaneous observations of 30 mHz riometer absorption made near the geomagnetic poles during several solar cosmic ray events (Kane and Masley, 1972) showed a relationship between riometer absorption and intensity of protons with energy greater than 10 MeV. The expected values of the 30- and 50-mHz riometer absorptions have been calculated for the larger events between June 1969 and Sept. 1970 using OGO-6 satellite data. The calculated and measured absorptions agree well.

K-11684
Pomerantz, M.A. , Duggal, S.P.
COSMIC RAY INTENSITY VARIATIONS IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.162-163, 6 refs.
G845.A56

Observations from a network of antarctic and arctic stations have recently established that a north-south anisotropy is a characteristic feature of every cosmic ray storm. An unusual type of north-south anisotropy was discovered during a cosmic ray storm on Jan. 27, 1971 in which no reduction in intensity was observed at antarctic stations for 24 hr in contrast to the arctic stations. On Jan. 24, 1971, just before the onset of the storm, relativistic solar cosmic rays with energies up to approx 5 GeV were detected in a ground level event which displayed a hertofore unobserved sectorial pattern of anisotropy which was limited to a narrow and stable region that was confined to the antarctic stations. Two distinct solar flares were considered potential sources for these relativistic particles. Analysis is still in progress on another unusual solar particle event (Sept. 1-2, 1971), characterized by a source on the back side of the sun.

K-11685
Peden, I.C.
VLF DIELECTRIC AND LOSS PROPERTIES OF THE ICE SHEET AT BYRD STATION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.164-165, 6 refs.
G845.A56

The results of an experiment conducted near Byrd Station in Nov. 1970 using the 34-km longwire antenna are summarized. Properties of the very low frequency surface magnetic field at seven frequencies between 5 and 20 kHz were determined experimentally. The data were converted into effective bulk average values of the complex permittivity parameter (dielectric and loss) of the antarctic ice sheet in a frequency band where they had not been measured before. The results have important applications to studies of the upper atmosphere involving VLF antennas and propagation. The results of the complex permittivity calculations are displayed in a standard Cole-Cole plot.

K-11686
Rogers, J.C. , Peden, I.C.
EFFECT OF BYRD DRILL HOLE DIAMETER VARIATIONS ON IN SITU ELECTRICAL MEASUREMENT OF THE ICE SHEET. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.165-166, 3 refs.
G845.A56

Variations in the diameter of the Byrd drill hole have been measured to a depth of 1,500 m and the influence of these variations on the input admittance of the dipole probe lowered into the hole to investigate the complex permittivity of the ice sheet as a function of depth and of frequency in the VLF range has been observed. Variations in the drill hole diameter (from 18.5 to 20 cm over the depth span measured) are generally attributable to drilling procedures. The influence of hole diameter variations on the input admittance of an electrically short dipole is related to the varying diameter of the dielectric sheath surrounding the probe.

K-11687
Helms, W.J.
VERTICAL SOUNDING OF THE POLAR D-REGION. Antarctic journal of the United States, Sept.-Oct. 1972 7(5), p.166-168, 1 ref.
G845.A56

Vertical sounding data of the polar ionosphere over Byrd Station show a clear relationship between enhanced solar proton flux and large decreases in average D-region height. It appears that the chemistry is different in the upper and lower parts of the D-region and that a dip in the electron density profile sometimes occurs. Three electron density profiles taken during the onset of a polar cap absorption event show an electron density increase in the D-region at all levels. During this event an interesting lag was noted between the onset of the ionospheric effects from the solar proton flux as seen by the Explorer 41 satellite. The history of the event is discussed.

K-11745
Mende, S.B.
1972 AURORAL PHOTOMETRY AT SOUTH POLE STATION. Interim technical report, NSF-C-659, Palo Alto, Calif., Nov. 1972, 9p., 1 ref.

The geographic South Pole is located at a geomagnetic latitude which is most advantageous for ground based observations of the dayside auroral oval. To accomodate the particularly harsh environment at the South Pole Station, to facilitate semi-automatic mode of operation, and to take advantage of the photometric measurement techniques pioneered by the Lockheed group, a new photometer was constructed and deployed at the station in Jan. 1972. The photometer was operated successfully throughout the 1972 austral winter, roughly between Apr. and Sept. 1972. The data was taken on computer compatible tape and on analog chart records.

K-11749
Rostoker, G.
GEOMAGNETIC INDICES. Reviews of geophysics and space physics, Nov. 1972 20(4), p.935-950, 22 refs.
QC801.R46

The purpose of this review is to outline the definition and method of derivation of the indices of geomagnetic activity that are most commonly used at present. The first part of the review presents the methods of derivation of Kp, ap, AE, and Dst; the second part involves a discussion of the strengths and weaknesses of each index. Halley Bay and Byrd Station data are used in the computation of the AE index over the interval 1957-1964. It is shown that the distribution of magnetic observatories whose data are used in the production of the indices strongly influences the quantitative reliability of the indices in varying degrees. Furthermore, it is found that, in general, indices are only capable of defining the lower limit of

geomagnetic activity at any given time. It is concluded that indices should only be used in statistical studies of solar-terrestrial interactions; their use in the study of individual events is generally not advisable.

K-11750
Wilcox, J.M.
INFERRING THE INTERPLANETARY MAGNETIC FIELD BY OBSERVING THE POLAR GEOMAGNETIC FIELD. Reviews of geophysics and space physics, Nov. 1972 29(4), p.1003-1014, 24 refs.
QC801.R46

L. Svalgaard and S.M. Mansurov have shown that it is possible to infer the polarity of the interplanetary magnetic field quite realiably from observations of the diurnal variation of the polar geomagnetic fields. The effect is most prominent in the vertical component of geomagnetic observatories near the geomagnetic poles, such as Thule and Vostok, during several hours near noon. The specific nature of the relation between the interplanetary field and the polar geomagnetic field should aid toward physical understanding of the interaction between the two fields. It has already been shown that it is the direction of the azimuthal (i.e., not the radial or north-south) component of the interplanetary field that is significant in causing this effect.

K-11799
Driatskii, V.M.
SEPTEMBER 2, 1966 SOLAR PROTON FLARE AND PROCESSES IN THE LOWER IONOSPHERE. Protonnaia vspyshka na Solntse 2 sentiabria 1966 g. i protsessy v nizhnei ionosfere. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1970 Vol.288, p.74-81, 15 refs.

Processes in the lower ionosphere resulting from the September 2, 1966 solar proton flare were measured with riometers. Cosmic ray absorption was computed for the first minute of each hour. Observations were made at six Arctic stations and three Antarctic ones (Vostok, Mirnyi, Molodezhnaia). PCA variations for all three Antarctic stations and absorption rate at two frequencies with consideration of the relationship between absorption and variations in the sun's zenith angle, at Vostok are graphed.

K-11867
Zhulina, E.M. , Driatskii, V.M., Shchuka, T.I., Zhulin, I.A., Cambou, F., Saint-Marc, A.
DYNAMICS OF AURORAL-PARTICLE INJECTION DURING SUBSTORMS. Geomagnetism and aeronomy, Nov. 1972 12(2), p.212-218, Translation from Geomagnetizm i aeronomiia, 12(2):243-251, 1972. 16 refs.

The space-time dynamics of the auroral-electron spectrum during several substorms in the earth's magnetosphere is estimated from balloon data on bremsstrahlung X-rays in March-April 1968 (L equals 3.8). The pattern of appearance and development of these substorms in absorption has been traced. A picture of the dynamics of auroral-particle injection in substorm periods is proposed. A close relation is found between X-ray bursts and an increase in cosmic noise absorption, according to riometer data, obtained at 28 stations in the Northern and at 9 stations in the Southern Hemispheres.

K-11890
Park, C.G.
WHISTLER OBSERVATIONS OF THE DEPLETION OF THE PLASMASPHERE DURING A MAGNETOSPHERIC SUBSTORM. Journal of geophysical research, Feb. 1, 1973 78(4), p.672-683, 28 refs.
QC811.J6

Whistlers recorded in Antarctica and North America were used to monitor changes in electron concentrations in the dayside plasmasphere during isolated substorm activity. The 'viewing area' of the whistler receiver network extended over L = 2 to 6 and 6 hours in geomagnetic time. Before the substorm, the plasmasphere was relatively full and smooth, and there was no evidence of large longitudinal variations in plasma distribution. Immediately after the substorm onset, parts of the plasmasphere were depleted rapidly and produced large-scale structures with sharp longitudinal gradients in plasma density. The depletion of the plasmaspheric tubes is interpreted in terms of downward flow of plasma into the underlying ionosphere. Simultaneous ionosonde records show enhanced critical frequencies in the underlying F2 layer. These results indicate that significant amounts of plasma in the plasmasphere are dumped into the ionosphere during geomagnetic disturbances and that this is an important process in storm phenomena in both regions. (Auth.)

K-11891
Wehrlin, N. , Gendrin, R., Roux, A., Welti, R.
FINE STRUCTURE OF PC 1 PULSATIONS. 1. EXPERIMENTAL EVIDENCE. Journal of geophysical research, Feb. 1, 1973 78(4), p.763-768, 12 refs.
QC811.J6

Ground-based records of the magnetic field of the micropulsations from Kerguelen and its conjugate point, Sogra, and Heard I. were used to study the fine structure of Pc 1 pulsations. Analyses of 20 events indicated that the Pc 1 pulsations do present a fine structure, with mother and daughter lines. The frequency separation between these lines is of the order of 5/100 Hz. The mother line decreases in amplitude when a daughter line appears and reaches some time later a sort of saturation level. When it is measured from the ground, the saturation level for each line is of the order of 30 m gamma. The narrowness of each line, the existence of a saturation level, and the appearance of side band lines give evidence that nonlinear effects play an important role during the generation process of Pc 1 pulsations.

K-11902
Shirochkov, A.V.
SOVIET EXCHANGE SCIENTIST AT BYRD STATION, ANTARCTICA, 1971: PRELIMINARY RESEARCH RESULTS. Antarctic journal of the United States, Nov.-Dec. 1972 7(6), p.259

The author spent a year as an exchange scientist at the U.S. Byrd Station; his program covered the physics of the ionosphere and radio wave propagation with emphasis on the study of abnormal events of radio wave absorption that are characteristic of high geomagnetic latitudes. A riometer and other instruments recorded such phenomena as auroral effects, cosmic noise absorption, low frequency emissions of the ionosphere, and visual aurora. The Byrd Station riometers recorded three PCA events. One of them, which occurred Jan. 24-29, when the ionosphere was continuously sunlit, was rather significant. The absorption started to intensify on the 24th at 2030 UT, reaching maximum (12.7 decibels at 30 mHz) on Jan. 25 at 2030 UT.

K-11909
Duggal, S.P. , Guidi, I., Pomerantz, M.A.
UNUSUAL ANISOTROPIC SOLAR PARTICLE EVENT OF NOVEMBER 18, 1968. Solar physics, 1971 No.19, p.234-246, 13 refs.

The ground level event of November 18, 1968, was unusual in that pronounced anisotropy persisted essentially until the cessation of the arrival at earth of relativistic protons. Real and significant differences were observed in the intensity profiles at different neutron monitor stations. The onset times of the ground level events were related to the angular differences between the mean directions of of viewing and the axis of symmetry. The event differed markedly from earlier isotropic events that were well described by diffusion theory, but was compatible with the predictions of a model envisaging diffusion only in the vicinity of the Sun (radium R of solar envelope approximately equal to 34 solar radii). The diffusion coefficient of 3x10 exp 21 sq cm/s is consistent with that deduced for earlier isotropic events, but the values of other parameters are smaller than those derived for the only previously observed event to which the model of diffusion in an inhomogeneous medium was applicable (May 4, 1960). It is concluded that the observed 100 percent anisotropy was a direct consequence of the propagation mechanism rather than of other postulated causes. Furthermore, the observed large pitch-angle distribution was produced by scattering from small-scale field irregularities. The network of 19 stations at which the observations were made, included 3 Antarctic locations. (Auth. mod.)

K-11911
King, G.A.M. , Savage, P.J.
INCIDENCE OF SLANT SPORADIC-E IN SUMMER AT SCOTT BASE. Journal of atmospheric and terrestrial physics, Feb. 1973 35(2), p.363-365, 3 refs.

At Scott Base, inside the polar cap, under conditions of continuous sunlight slant sporadic-E occurs almost every day. During the morning hours the probability of occurrence exceeds 0.3. An interesting phenomenon at times associated with s-Es is a gap in the F-region echoes which is due to neither absorption nor blanketting. (Auth.)

K-11912
Kaminer, N.S. , Kashevarov, V.P., Kuz'micheva, A.E., Dorman, L.I.
NORTH-SOUTH ASYMMETRY IN THE INCREASE OF COSMIC-RAY INTENSITY BEFORE MAGNETIC STORMS. Geomagnetism and aeronomy, Dec. 1972 12(3), p.343-347, Translated from Geomagnetizm i aeronomiia, 12(3):385-391, 1972. 9 refs.

The north-south asymmetry of the increase is investigated. The dependence of the expected north-south asymmetry on the distance of the region of effective quasispherical shock wave generation from the sun is computed on the basis of model representations. A comparison of the results with experimental data shows that quasispherical shock waves are generated at a distance of approximately 0.3 AU from the sun. It is demonstrated that in some cases data on the north-south asymmetry of the increase permit identifying the chromospheric flare responsible for a given Forbush effect. The data analyzed include measurements made at South Pole and McMurdo. (Auth. mod.)

K-11913
Ben'kova, N.P. , Bukin, G.V., Driatskii, V.M., Zhulin, I.A.
IONOSPHERIC DISTURBANCES OF MARCH 6-10, 1970. Geomagnetism and aeronomy, Dec. 1972 12(3), p.383-390, Translated from Geomagnetizm i aeronomiia, 12(3):431-439, 1972. 7 refs.

Ionospheric disturbances and their relation to solar activity during March 6-10, 1970, are investigated. This period was characterized by enhanced magnetic-ionospheric disturbances associated with the passage across the solar disc of several active regions with large spots, chromospheric flares, and intense facula fields. Riometer and ionospheric station observations throughout the world are given for this period. A large magnetic storm with several superimposed substorms was produced by a flare with a broad spectrum of geophysically effective radiation: X-ray and UV, a flux of fast protons, and ordinary corpuscular streams. The proton fluxes produced polar cap absorption and the corpuscular stream produced a ring current and a planetary change of the F2-region. The substorms were accompanied by the precipitation of magnetospheric particle fluxes into the lower ionosphere and the energy spectra of the effects caused by them in the lower ionosphere differed for the substorms due to the storm phase.

K-11914
Best, A. , Van'ian, L.L., Dubrovskii, V.G., Kramarenko, S.A., Lemann, G.-R.
LATITUDINAL ENERGY DISTRIBUTION OF GEOMAGNETIC DISTURBANCES. Geomagnetism and aeronomy, Dec. 1972 12(3), p.432-434, Translated from Geomagnetizm i aeronomiia, 12(3):488-491, 1972. 3 refs.

The energy spectra of the geomagnetic storm of May 24-27, 1967, are investigated for 10 global-network stations, including South Pole. It is found that the energy of the H-component increases in the equatorial zone as a function of the period of variation. The frequency dispersion of the decrease in the average power of disturbances with decreasing latitude has been determined.

K-11915
Dolginov, Sh.Sh. , Ivchenko, M.P., Orlov, V.P., Pushkov, A.N., Tiurmina, L.O., Cherevko, T.N.
SECULAR GEOMAGNETIC FIELD VARIATION OF THE EPOCH 1965-1970, ACCORDING TO OBSERVATORY AND SATELLITE OBSERVATIONS. Geomagnetism and aeronomy, Dec. 1972 12(3), p.445-452, Translated from Geomagnetizm i aeronomiia, 12(3):503-512, 1972. 13 refs.

The possibility of using two noncoincident satellite surveys to determine the secular variation of the absolute total vector and to refine the secular variation of the components is investigated. The method is used to compare isopor charts of the 1965-1970 period. (Auth.)

K-11916
Bol'shakova, O.V. , Gul'el'mi, A.V.
PENETRATION OF HYDROMAGNETIC WAVES FROM THE TAIL OF THE MAGNETOSPHERE INTO THE POLAR CAP. Geomagnetism and aeronomy, Dec. 1972 12(3), p.505-509, Translated from Geomagnetizm i aeronomiia, 12(3):569-571, 1972. 7 refs.

Preliminary experimental results of a study of Pc2 pulsations at the geomagnetic poles are reported. Identification of the pulsations observed in the polar cap with hydromagnetic waves arriving from the tail of the magnetosphere was attempted. Data suggested that the primary source of mid-latitude Pc2 is located in the tail. A model for the leading PD and lagging Pc2 effects is postulated: as a solar-wind

inhomogeneity advances on the magnetosphere, irregular PD appear in the polar cap at the instant of first contact; as the inhomogeneity moves along the tail it disturbs the particle distribution in the tail so that self-excitation of magnetic pulsations occurs; then the pulsations propagate along the tail and penetrate into the polar cap in the form of Pc2. Further experiments at both geomagnetic poles simultaneously with with tests on a satellite moving in the magnetospheric tail are recommended to determine the nature of physical processes in the distant tail region.

K-11933
Stephens, C.P.
ANTARCTIC IONOSPHERE AND ITS RELATION TO GEOMAGNETIC ACTIVITY DURING 1966. New Mexico State University. Physical Science Laboratory. Report, May 1967 PA00524, 78p., 70 refs.

The effect of the ionosphere on satellite signals received at McMurdo Station, Antarctica is used to determine the total electron content of the Antarctic ionosphere. Variations in the ionosphere are related to distortions of the cavity in the solar wind formed by the earth's magnetic field. The period of measurement was from May 1966 through December 1966 and approximately one measurement per week was obtained. In addition to the variations, a seasonal trend is evident in the results with the electron content increasing by a factor of 4 during the transition from the winter night to the summer day. (Auth.)

K-11949
Medvedev, N.D.
INVESTIGATION OF THE SECULAR PATTERN OF MAGNETIC DECLINATION IN THE SOUTHERN OCEAN. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.77-80, Translated from its Informatsionnyi biulleten', No.80, 1970. 7 refs.

Magnetic declination D data collected during the voyage of J. Cook around Antarctica in 1772-1775 is compared with Soviet observations made in 1965. The position of the zero D isopor is stable at several points. Data on magnetic declination in the Southern Ocean are tabulated.

K-11950
Zhigalov, L.N.
SOME CHARACTERISTICS OF THE COASTAL EFFECT IN MAGNETIC VARIATIONS AT MIRNYY. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.81-83, Translated from its Informatsionnyi biulleten', No.80, 1970. 7 refs.

Sharp differences in intensity, form, and sign of field changes at closely located observation points are typical of anomalies in geomagnetic variations at Mirnyy Station. In a further attempt to explain the coastal effect on geomagnetic variations, Z and H variations were analyzed during years of low solar activity, using 1959 and 1965 for comparison. High K values for equally disturbed days can be explained by the predominance of variations with a smaller period in years of minimum solar activity compared with years of maximum activity. The strong decrease of K with increasing activity probably depends mainly on the considerable broadening of ionospheric current systems that closely approach Mirnyy. Thus, the coastal effect persists also in years of minimum solar activity and the contribution of the field of induced currents to Z variations is even greater than in years of maximum activity, a fact explained by the predominance of fluctuations of a longer period in years of maximum activity. Field fluctuations of shorter period predominate in the morning-afternoon hours, causing stronger coastal effect than at night.

K-11951
Shneer, V.S. , Bobakov, I.N., Fonarev, G.A.
COASTAL EFFECT IN GEOMAGNETIC VARIATIONS IN THE MOLODEZHNAYA STATION AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.83-86, Translated from its Informatsionnyi builleten', No.80, 1970. 4 refs.

Special observations at Molodezhnaya Station in 1967-1968 established the extent of a coastal effect in geomagnetic variations. Figures illustrate variations and direction of the vector of marine telluric currents and changes in the amplitudes of geomagnetic variations along the profile normal to the coast. Variation anomalies at Molodezhnaya are associated with both coastline and sea floor relief. In spite of the length and shallowness of the shelf, the coastal effect in magnetic variations is relatively strong in the Mirnyy and Molodezhnaya areas because conductivity of coastal and bottom rocks is fairly high. Observations near the water's edge are continuing.

K-11952
Lukashkin, V.M.
REGULAR RADIO WAVE ABSORPTION, ACCORDING TO RIOMETER OBSERVATIONS AT VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.86-90, Translated from its Informatsionnyi biulleten', No.80, 1970. 11 refs.

Riometer observations of regular absorption through the entire ionosphere at a frequency of 30 MHz at Vostok Station were made from April 1965 through March 1966. The data represents integral absorption for vertical incidence; monthly curves of diurnal absorption variations are given from this data. The share of each ionospheric region in the absorption is discussed. Absorption by the D-region averages about 40 percent and that by the E-region 60 percent. Monthly variations are tabulated.

K-11953
Astakhov, P.G.
DEPENDENCE OF DIURNAL AURORAL FREQUENCY VARIATIONS ON MAGNETIC ACTIVITY AT THE SOUTH POLE (1967). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.90-93, Translated from its Informationnyi biulleten', No.80, 1970. 9 refs.

Photometric and visual observations of zenith auroras were made from April to August, 1967, at Amundsen-Scott Station. They appeared almost daily and had an average total diurnal duration of about six hours. Graphs cover total annual duration of auroras, curves of the positions of magnetic activity epochs, diurnal probability pattern, and dependence of the number of zenith auroras on the K index. The conclusions support the general pattern of auroral particle precipitation of Hartz and Brice.

K-11963
Kainuma, S. , Shiro, I., Yamaoka, M., Ichinose, M., Sakamoto, T.
EXPERIMENTAL RESULTS OF THE HF PROPAGATION AT

SYOWA STATION, ANTARCTICA. Antarctic record, Nov. 1972 No.45, p.1-11, In Japanese with English summary. 2 refs.

Continuous measurement of the field strength of NHK's overseas broadcasting waves (JOB, 11.815 MHz) was carried out from Apr. 1970 to Feb. 1971. Diurnal variations in field strength were absent at equinox, but in other months field strength dropped after sunset. Night-time signals at Showa Station were received mainly through the long path on the great circle. The mode of propagation varies with the condition of the ionosphere, and the mixed mode (e. g. E plus F layer reflection waves) is often predominant. At the main phase of sudden commencement of a magnetic storm, the field strength abruptly drops, and this effect must be taken into consideration for the operation of communications. (Auth.)

K-11981
Mizera, P.F. , Fennell, J.F., Blake, J.B.
POLAR CAP MEASUREMENTS OF SOLAR PROTONS WITH ENERGIES DOWN TO 12.4 KEV. Aerospace Corporation, El Segundo, California. Aerospace report, Oct. 1, 1972 TR-0073(3260-20)-5, 18p., SAMSO-TR-72-254, 10 refs.

Solar protons with energies down to 12.4 keV were measured over the polar caps by instruments aboard the OV1-17 satellite. The observations were made following the Mar. 21 1969 solar-particle event. Comparision of the South Polar flux measured at 1530 UT with the North Polar flux at 1500 UT showed an increase commensurate with the interplanetary observations of Explorer-35. The polar-cap differential fluxes measured by OV1-17 and Injun-5 from 0.012 MeV to 1.1 MeV are well represented by a single power law. Over a 22 hour period the spectral index changed from 1.7 to 1.9. Temporal and spatial comparisons were made with data from the Explorer-35 and Injun-5 spacecraft. Good agreement is found at energies (>300 keV) where a comparison can be made.

K-11985
Barcus, J.R. , Brown, R.R., Karas, R.H., Bronstad, K., Trefall, H., Kodama, M., Rosenberg, T.J.
BALLOON OBSERVATIONS OF AURORAL-ZONE X-RAYS IN CONJUGATE REGIONS. Journal of atmospheric and terrestrial physics, March 1973 35(3), p.497-511, 19 refs.
QC801.J6

Conjugate aspects of auroral zone electron precipitation are examined using X-ray data obtained from balloon flights launched from conjugate sites, Reykjavik, Iceland and Showa, Antarctica in the winter of 1969. In spite of the close conjugacy of these sites, dissimilarities were noted between observations in the two hemispheres, especially for midnight events. This is attributed in part to balloon drift and motions of narrow precipitation regions. For a dayside event, close conjugate relations were found even though the X-ray detectors were out of conjugacy by approx. 700 km. Riometer data from this event suggest that the intensity of electron precipitation was significantly smaller in the southern hemisphere. (Auth.)

K-12031
Drobzhev, V.I. , Anan'ev, V.A., Kulakovskii, E.A.
POLAR CAP ABSORPTION. Sovetskaia antarkticheskaia ekspeditsiia. 1955-. Information bulletin, Feb. 1973 8(3), p.166-167, Translated from its Informatsionnyi biulleten', No.81, 1970.

Polar cap absorption is graphed for the April 12-19, 1969 period at Mirnyy Observatory and the incidence of major PCA phenomena during the first six months of 1969 is reported. Brief comments on methods of recording PCA are included.

K-12032
Shumilov, I.A.
MEASUREMENT OF RADIO-WAVE ABSORPTION IN THE IONOSPHERE BY THE DOUBLE CIRCULAR POLARIZATION METHOD. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Feb. 1973 8(3), p.168-170, Translated from its Informatsionnyi biulleten', No.81, 1970. 2 refs.

A circularly polarized riometer was installed at Molodezhnaya Station to measure radio-wave absorption in the ionosphere at a frequency of 16.6 MHz. Antenna design is sketched and described and the mathematical principles on which the double circular polarization method of measurement is based are outlined. Data on variance of observed cosmic-noise intensities over stellar time are graphed. Fairly accurate values of cosmic noise beyond the ionosphere at frequencies below 20 MHz were obtained. It was found that radio-wave absorption can be estimated without knowing cosmic-noise levels beyond the ionosphere.

K-12043
Shipstone, D.M.
STUDY OF THE RADIO AURORA AND METEORS AT HALLEY BAY DURING THE I.Q.S.Y.. British Antarctic Survey. Scientific reports, 1972 No.74, 68p. + plate, 116 refs.

Radio-auroral observations at 71.3 MHz were made from Halley Bay using a system of three rhombic aerials. Discrete and diffuse radio aurorae were found to occur in separate oval distributions which were eccentric with respect to the geomagnetic pole. It is shown that the radial velocities of diffuse radio aurorae cannot be those of ion-acoustic waves. A variation with geomagnetic latitude in the time at which the radial motions of radio aurorae reverse direction was found which is consisted with the suggestion that the aurorae move in the direction of the electron current in the ionosphere. It is demonstrated conclusively that radio aurorae are frequently not due to radio-wave reflections from aurorae visible to the naked eye. Associations have been found between radio aurorae and a number of types of sporadic E. A negative correlation found between radio aurorae and ionospheric black-outs in the evening has important implications for riometer studies of auroral absorption.

K-12048
Torr, M.R. , Torr, D.G.
IONIZATION ENHANCEMENTS IN THE POST-MIDNIGHT HOURS AT SOME ANTARCTIC STATIONS AND THE DIURNAL EXCURSION OF THE AURORAL OVAL. South African journal of antarctic research, 1972 No.2, p.32-34, In English with Afrikaans summary. 10 refs.

An analysis of various ionospheric parameters at SANAE, Antarctica, indicates that the diurnal excursion of the auroral contributes to the behavior of the ionosphere at SANAE in the early morning hours, at all altitudes and even during magnetically quiet conditions. This influence was found to be much less pronounced at Winniped and Campbell Island, both of which lie on the same geomagnetic latitude as SANAE, but they differ from SANAE in that the former lies in the Northern Hemisphere and the latter, although Southern Hemisphere, lies outside the South

Atlantic geomagnetic anomaly. The implications are that the auroral oval, or some associated ionizing phenomenon, moves further towards the equator in the Southern Hemisphere, and that this may be more pronounced in the vicinity of the magnetic anomaly than it was elsewhere. (Auth.)

K-12049
Greener, J.G. , Gledhill, J.A.
ELECTRON FLUXES OBSERVED NEAR SANAE, ANTARCTICA, BY THE SATELLITE ALOUETTE I DURING 1962-3. South African journal of antarctic research, 1972 No.2, p.35-39, In English with Afrikaans summary. 7 refs.

From an analysis of measurements of electron fluxes made with the satellite Alouette I during 1962/3, estimates are made of the likely values and variation of the precipitated flux of electrons with energies greater than 40 keV near SANAE. A mean precipitated flux of 150,000 electrons/sq cm/s is suggested, with a pronounced diurnal variation, reaching a maximum of the order of 300,000 electrons/sq cm/s just after local midnight and a minimum of about 30,000 electrons/sq cm/s near noon.

K-12050
Torr, D.G. , Torr, M.R.
PROBLEMS IN EXPLAINING THE BEHAVIOR OF THE F1 LAYER. South African journal of antarctic research, 1972 No.2, p.40-44, In English with Afrikaans summary. 11 refs.

Experimental and theoretical curves of the diurnal variation of electron plasma frequency in the height range 120 to 200 km are compared in the latitude range 32 to 78 S. It is shown that at very high latitudes (Scott Base, 78 S, L = 34) the F1 layer is almost completely under solar control in summer and that ionization below 200 km disappears almost completely during the winter polar night. At moderately high latitudes (Halley Bay 75 S, SANAE 70 S, L = 4) the results indicate that the F1 layer is caused by a combination of a flux of precipitated electrons and solar extreme ultraviolet radiation (XUV) in both winter and summer. The precipitated electrons are the dominant cause in winter and the solar XUV radiation the main cause in summer. Comparison between experimental and theoretical results for Argentine Island (65 S, L = 2.4), Godley Head (44 S, L = 2.4) and Mundarin (32 S, L = 1.76) indicate that the agreement becomes very much worse towards lower geographical latitudes if ionization only by solar XUV radiation is taken into account. The discrepancy is most pronounced in winter and it is shown that it cannot be explained in terms of variations in normal aeronomic parameters. Since there is no evidence of a permanent corpuscular energy influx at middle latitudes, no explanation is offered at this stage for this discrepancy. (Auth.)

K-12051
Kuhn, G.J. , Sutcliffe, P.R.
EVIDENCE OF A PHASE REVERSAL IN THE QUIET DAY VARIATION OF THE MAGNETIC VERTICAL INTENSITY AT MARION ISLAND. South African journal of antarctic research, 1972 No.2, p.45-48, In English with Afrikaans summary. 9 refs.

Absolute observations of the geomagnetic Z component done on Marion Island on two consecutive quiet days in May 1971 showed a phase reversal in the daytime variation of this component when compared with the expected Sq variation for the latitude of the island. The results are compared with theoretical approximations for the "island effect" and with experimental results obtained by other workers who found the "island effect" only for periods much shorter than that for which the effect is observed at Marion Island. (Augth.)

K-12052
Van der Walt, A.J. , Stoker, P.H., Alberts, H.W.
LATITUDE DISTRIBUTION OF COSMIC RAYS AT SEA LEVEL FROM 1963 TO 1970. South African journal of antarctic research, 1972 No.2, p.48-52, In English with Afrikaans summary. 10 refs.

The latitude distribution of cosmic rays at sea level, in the region of the Cape Town Magnetic Anomaly, compares well with the distribution in the North American region when vertical cutoff rigidities computed from particle trajectories in a simulated geomagnetic field are used. From the North American latitude distribution during minimum modulation of cosmic rays in May 1965, the distributions in January of each year from 1963 through the 1970 were calculated. They were found to compare well with the survey data if uncertainities in air pressure and changes in the rigidity dependence of the modulation of cosmic rays in 1969 and 1970 were taken into consideration.

K-12055
Burch, J.L.
EFFECTS OF INTERPLANETARY MAGNETIC SECTOR STRUCTURE ON AURORAL ZONE AND POLAR CAP MAGNETIC ACTIVITY. Journal of geophysical research, March 1, 1973 78(7), p.1047-1057, 23 refs.

For quiet (C9 < 2) and quiet to moderately disturbed (C9 < 4) conditions in the period 1964-1968, the following sector structure dependence of auroral zone positive and negative bay activity, as measured by the AE components AU and AL, is noted. (1) There is a broad summertime peak in AU for both sector polarities, with AU higher for toward sectors during the first half of the year and with no apparant sector dependence during the second half of the year. (2) A stronger sector dependence is evident for AL, which peaks for toward sectors in the spring and for away sectors in the fall. (3) In a single 6-month period, negative bay magnitudes at College and at its southern hemisphere conjugate station, Macquarie Island, followed the same sector dependence as AL. (4) During this same period the ratio fo College to Macquarie Island negative bay magnitudes was higher for away sectors than for toward sectors, and this asymmetry persisted through the midwinter crossover in sector dependence that occurred for each individual station. A similar N-S asymmetry is found in the polar cap. The ratio of DP 2 type activity at Vostok to that at Thule was greater by a factor of about 1.75 for toward sectors than for away sectors for periods near the 1967 spring and fall equinoxes. (Auth.)

K-12057
Takagi, M. , Kanada, M.
GLOBAL VARIATION IN THE ATMOSPHERIC ELECTRIC FIELD. Pure and applied geophysics, Aug. 1972 Vol.100, p.44-53, 12 refs.

An analysis of the global nature of the atmospheric electric field is presented on the basis of comparison of measurements on the research vessel Hakuho-Maru on the Mid- and South-Pacific Ocean, with those at Showa Station in Antarctica and on two vessels on the Mid-Atlantic Ocean. The comparison of daily averages gave a different type of latitude dependence, which was characterized by a gradual decrease toward the antarctic region. Diurnal variations

at these globally representative stations on the same day were checked with each other for the first time, and the correlation between them was found much higher than that between land stations. The regional effect, which might depend on the distance from the thunderstorm area, was not evidently detected. So the influence of the generator area was considered to propagate over the entire globe without significant attenuation. (Auth.)

K-12059
Kasemir, H.W.
ATMOSPHERIC ELECTRIC MEASUREMENTS IN THE ARCTIC AND ANTARCTIC. Pure and applied geophysics, Aug. 1972 Vol.100, p.70-80, 11 refs.

During the International Geophysical Year, 1958, and extending into 1959, the atmospheric electric field, current, and conductivity were recorded at Thule, Greenland (78 N). During the International Year of the Quiet Sun, 1964, records of the atmospheric electric field were obtained at the Amundsen-Scott Station at the South Pole (90 S). The diurnal variation averaged over the year of the normalized current at Thule and the normalized field at the South Pole show a surprisingly good agreement. These two curves combined into one represent the world time variation of the air-earth current (or field) in the Polar regions. Compared with the oceanic diurnal field variation obtained at the Carnegie ship cruises, the Polar curve shows a very similar shape but a much reduced amplitude. No conclusive explanation of the deviation of the two curves can be offered. The diurnal variation of the Polar data averaged over a season displays very smooth and similar curves during Northern autumn and winter. The spring and summer curves show a much more detailed structure with several maxima and minima. It is somewhat unexpected that the summer curve with a variety of the structure is the flattest curve of all seasons. (Auth. mod.)

K-12060
Lobodin, T.V. , Paramonov, N.A.
VARIATION OF ATMOSPHERIC ELECTRIC FIELD DURING AURORAE. Pure and applied geophysics, Aug. 1972 Vol.100, p.167-173, 11 refs.

Measured data of the atmospheric potential gradient E during aurorae are summarized. It is shown that aurorae in the northern hemisphere decrease E, and aurorae in the southern hemisphere increase E. Depending on auroral intensities, variations of E reach 30-35 percent of the mean. Deviations of E from normal values, on the average, begin 3.5 hours before and end 3 hours after aurora occurrence. (Auth.)

K-12102
Pomerantz, M.A. , Duggal, S.P.
RECORD-BREAKING COSMIC RAY STORM STEMMING FROM SOLAR ACTIVITY IN AUGUST 1972. Nature, Feb. 2, 1973 241(5388), p.331-333, 8 refs.
Q1.N2

A description is given of the gross features of the greatest cosmic ray storm ever observed, that commenced on Aug. 4 and of which sunspot group 331 was the ultimate source. The storm occurred near the minimum of an unspectacular solar cycle and the magnitude of the decrease reached 27 percent in about 24 hr. An anisotropy in the direction perpendicular to the ecliptic plane is a characteristic feature of cosmic ray storms, and produces a north-south asymmetry which manifests itself in systematic differences in the magnitude of a Forbush decrease and/or in the onset times in the two polar regions. A precise determination of the time of commencement of FD-1 reveals that it occurred about 2 hr earlier at Thule. Presumably as a consequence of this delay, the magnitude of FD-1 at Thule was larger during the first six hours. On the other hand, although the onset of FS-2 at the northern station also preceded the start of this phase of the storm in Antarctica, the extent of the decrease at McMurdo was greater for several hours. At 0130 UT on Aug. 5 the magnitudes of the intensity reductions at four stations were: Thule, 21.5 percent; Swarthmore, 23.7 percent; McMurdo, 26.8 percent; and South Pole, 35.2 percent. The differences among the first three, all located near sea level, are a consequence of north-south anisotropy, whereas the predominate factor causing the enhancement of the effect at South Pole is the high altitude at which that station is located. An intensity increase ground level event at the polar stations was interpreted as representing the arrival at the Earth of relativistic particles of solar origin.

K-12134
Eccles, D. , King, J.W., Slater, A.J.
ISIS-1 SATELLITE OBSERVATIONS OF THE IONOSPHERE AT HIGH SOUTHERN LATITUDES. April 1973 35(4), p.625-632, 10 refs.

Topside sounder data from consecutive passes of ISIS-1 over the south polar region during November 1969 have been used to produce 'maps' of foF2, and these are compared with observations of the neutral N2 and electron concentrations reported by other workers. It is shown that at night at longitudes near 90 W large values of foF2 occur at latitudes lower than 70 deg S, but that at higher latitudes the critical frequency decreases rapidly, forming an ionization 'cliff' at approximately 60 deg invariant latitude. Evidence is presented which indicates that on the poleward side of the cliff appreciable heating of the atmosphere occurs and that the low values of foF2 are caused in the electron loss rate associated with an enhancement of the N2 concentration in the polar region. (Auth.)

K-12135
Hopkins, H.D.
ARIEL 3 SATELLITE OBSERVATIONS OF THE IONOSPHERE AT HIGH SOUTHERN LATITUDES. Journal of atmospheric and terrestrial physics, April 1973 35(4), p.633-637, 9 refs.

Electron density probe data from the Ariel 3 satellite are presented in the form of polar maps which show the spatial variation of the topside ionosphere at high southern latitudes for particular universal times in the winter and summer of 1967/1968. Various features, such as the observed variation with universal time, and also changes with local time and season, are described. In particular, at 06 UT in summer a region of low electron densities exists at high invariant latitudes bounded at 70 S in the western hemisphere by very large ionization gradients. (Auth.)

K-12137
Jorgensen, T.S.
PROGRESS IN ELF AND VLF EMISSION STUDIES AT HIGH LATITUDES. Denmark. Meteorologisk institut. Geofisiske meddelelser, 1970 R-20, 18p., 32 refs.
QC801.D45

Research on chorus, ELF hiss, and auroral hiss in the frequency range from about 100 to 500,000 Hz (ELF and VLF) is reviewed. Experiments indicate that chorus and ELF hiss are

generated at several thousand km altitude. There is much evidence that the source regions for these noises are in and near the geomagnetic equatorial plane, but observations also show that the source region may be around 45 deg lat. Auroral hiss is generated in the polar regions in close association with the visible aurora of the ionosphere and magnetosphere. The source region probably extends from the bottom of the ionosphere up to an altitude of a few earth radii. It appears likely that an electron cyclotron instability is responsible for chorus and ELF hiss, and that auroral hiss is due to Cerenkov radiation. While a positive correlation between substorms and chorus is observed, the relation between substorms and auroral hiss is not very clear. Further study in this area is recommended.

K-12143
Ogata, T. , Ose, M.
RIOMETER RECORDS OF 30 MHZ COSMIC NOISE AT SYOWA STATION, ANTARCTICA IN 1971. Japanese Antarctic Research Expedition. JARE data reports. Ionosphere, Nov. 1972 No.18, 62p.

Measurements were carried out using a standard riometer at 30 MHz with 3.5 kHz bandwidth connected to a vertically directed five-element Yagi antenna. The noise power output is recorded with a pen recorder at 1 mm/min paper speed, and the standard noise with power of 0, 1, 2, 3 and 4 dB levels is introduced into the receiver once a day as the calibration. Since the power observed in the riometer is not identical with the cosmic noise power itself, ionospheric absorption effects should be taken into account. The monthly range of time of maximum and minimum values of diurnal variation of cosmic noise power on quiet days is shown.

K-12166
Iwasaki, N.
LOCALIZED ABNORMAL GEOMAGNETIC DISTURBANCE NEAR THE GEOMAGNETIC POLE AND SIMULTANEOUS IONOSPHERIC VARIATION. Report of ionosphere and space research in Japan, 1971 25(2), p.163-186, 35 refs.

A peculiar geomagnetic disturbance with the reverse direction in the polar-cap region, which takes place frequently when the magnetic activity in the auroral zone is weak is discussed. This kind of geomagnetic variation is here designated as the polar local abnormal disturbance (DP-pole). The occurrence tendency and spatial extent of local abnormal disturbances in high latitudes are examined by many examples, and a typical equivalent current system is suggested. The local abnormal disturbance is found to be accompanied with a local increase in the electron density in the E region of the ionosphere, and possibly with an increase in the northward component of the interplanetary magnetic field. After examining the morphology of this localized abnormal disturbance in the polar region, the origin or the mechanism of the phenomena is discussed from the viewpoint of the interaction of solar wind with the magnetosphere. Magnetic data from Vostok, South Pole, and Wilkes Stations have been used in the analysis.

K-12167
Kodama, M. , Kusunose, M., Ogura, K.
CHARACTERISTICS OF THE ENERGETIC SOLAR X-RAY BURST OF 11 FEBRUARY 1970 OBSERVED AT BALLOON ALTITUDE. Report of ionosphere and space research in Japan, 1971 25(3), p.285-300, 20 refs.

On Feb. 11, 1970 a balloon-borne NaI scintillation detector launched from Showa Station in Antarctica recorded about a 28-fold intensity enhancement per second of energetic solar X-rays above 22 keV at a height of 7g/sq cm during a solar flare of class 2B started at 0704 UT. This is the largest X-ray burst observed so far at balloon altitudes. The hard solar X-ray burst commenced at about 0706 UT, when the solar microwave burst started, and lasted for nearly 7 min. Descriptions of the time-intensity profile and the energy spectrum of the hard solar X-ray burst are given in comparison with those of solar microwaves from 1 GHZ to 35 GHZ. Also, some characteristics of the quasi-periodic variation of X-ray intensities included in the event are investigated. Finally, qualitative comparisons of the balloon data with the observational results from the OSO-5 satellite are made.

K-12168
Morioka, A. , Saito, T.
DAYTIME IRREGULAR GEOMAGNETIC PULSATION, PID, AND ITS RELATION TO MAGNETOSPHERIC SUBSTORM. Report of ionosphere and space research in Japan, 1971 25(4), p.343-359, 21 refs.

The daytime irregular pulsation in the auroral zone (Pid) is studied on the basis of the data obtained with an induction magnetometer at Showa Station in 1968. The main results of the analysis show that (1) the waveform of Pid is expressed by a group of many impulses having an approximate pulse height of a fraction of gammas, a pulse width between one and five sec and a repetition period between five and twenty sec; (2) Pid occurs most frequently in the daytime and tends distinctly to occur on magnetically disturbed days; (3) Pid is frequently associated with the daytime cosmic noise absorption; (4) Pid appears in the day-side auroral zone with a systematic time lag behind the breakup of a magnetic substorm on the night side; and (5) the time lag of the onset time of Pid behind that of the substorm is proportional to the local time of the onset of Pid. On the basis of these observed results, the following model of the generation mechanism of Pid is proposed: a part of the energized electrons produced during the onset of the magnetospheric substorm drifts eastwards around the earth, and is precipitated into the day-side auroral zone, where they set up a pulsive ionospheric current, whose magnetic effect is observed as Pid. (Auth. mod.)

K-12169
Hayashi, K. , Kokubun, S.
VLF EMISSIONS DURING POST BREAKUP PHASE OF POLAR SUBSTORM. Report of ionosphere and space research in Japan, 1971 25(4), p.369-382, 20 refs.

Fine structure of VLF emissions during substorms are examined using data obtained at Showa Station in Antarctica. It is found that a special type of chorus emission, denoted here by auroral chorus, is observed during the maximum or recovery phase of substorm. The spectral structure of auroral chorus is quite different from that of daytime polar chorus. Rising elements with duration of about 0.2 sec intermittently appear in a group of several seconds' duration and the interval between these groups is usually of the order of ten sec. The whole event lasting about 40 min consists of short sequences of risers' groups overlapping in time in a frequency of 0.5 to approx 2 kHz. These characteristic time scales of chorus emissions during substorms are almost in agreement with those of pulsating aurora, suggesting a common origin for the energetic electron precipitation which causes pulsating aurora. (Auth.)

K-12170
Kokubun, S.
ASSOCIATION BETWEEN QUASI-PERIODIC VLF EMISSION AND MICROPULSATION. Report of ionosphere and space research in Japan, 1971 25(4), p.383-388, 9 refs.

The purpose of this note is to examine associations between micropulsations and VLF emissions in order to illustrate experimental evidence for hydromagnetic modulations of VLF emissions, based on four illustrative examples obtained at Showa Station. Examples are shown of 1) intensity modulated emissions accompanied by a worldwide geomagnetic change of several gammas; 2) periodic VLF emission associated with a regular micropulsation with a period of 10.8 sec; 3) the concurrent occurrence of quasi-periodic emission and quasi-sinusoidal micropulsation with a period of about 40 sec; and the association between VLF chorus emissions and irregular micropulsations.

K-12171
NATIONAL REPORT ON SPACE RESEARCH--SUBMITTED TO THE FOURTEENTH MEETING OF THE ICSU COMMITTEE ON SPACE RESEARCH (SEATTLE, 17 JUNE - JULY, 1971). Report of ionosphere and space research in Japan, 1971 25(4), p.389-408, Bibliography p.402-408.

A general review of space research activity in Japan since May is given. Space observations by sounding rockets, balloons, and satellites are summarized as well as major accomplishments in meteorology, atmospheric electricity, the ionosphere, the magnetosphere, the sun, moon, and planets, galactic radiation, and life sciences. The rocket lauching system at Showa Station has the capability to launch single-stage rockets S-160JA, S210JA, and S-350JA. The first experiment with two S-160JA sounding rockets took place on Feb. 10 and 17. Through successful flights, the vertical profiles of electron and ozone density in the polar ionosphere were obtained. S-160JF-3 was launched on Apr. 30, 1971. Seven flights of sounding rockets are scheduled at Showa Station during the austral winter, 1971. A bibliography of space science is appended to this report.

K-12172
JAPANESE PROGRAM FOR THE INTERNATIONAL MAGNETOSPHERIC STUDY--IMS (STP-COSPAR) COMMITTEE; SCIENCE COUNCIL OF JAPAN, JUNE 1971. Report of ionosphere and space research in Japan, 1971 25(4), p.409-415

Japanese IMS Committee recommendations for national research projects which will contribute much to the International Magnetospheric Study Program are presented. Direct sounding of outer space by rockets and balloons will be carried out at two locations in Japan and at Showa Station in Antarctica. Routine ground-based observations will also be carried at Showa Station, including geomagnetic variations, auroral photometry, various ionosphere soundings, whistlers and VLF emissions, riometers, and superneutron and meson monitors. The Polar Research Center, Tokyo, is responsible for organizing scientific research in Antarctica.

K-12173
Kamide, Y. , Fukushima, N.
POSITIVE GEOMAGNETIC BAYS IN EVENING HIGH-LATITUDES AND THEIR POSSIBLE CONNECTION WITH PARTIAL RING CURRENT. Report of ionosphere and space research in Japan, 1972 26(1/2), p.79-101, 42 refs.

Space-time characteristics of polar magnetic substorms in the evening hours are investigated, with the aid of a dense network of geomagnetic observatories in Europe. The positive bays in the evening high latitudes are not necessarily always the return current of an intense westward electrojet extended along the auroral oval, although it is true that a strongly concentrated eastward electrojet does often appear at the maximum phase of substorm. The H-increase from the pre-bay level at conjugate stations, Reykjavik and Showa, shows approximately the same magnitude. The features of the eastward electrojet are given. It is conjectured that the positive bay in high latitudes appears when the ionospheric conductivity is increased by the impinging protons from the partial ring current in the magnetosphere. The positive bay in high latitudes revealed by the concentration along the auroral-zone ionosphere of electric currents, which are connected with field-aligned currents from the partial ring current. (Auth. mod.)

K-12174
NATIONAL REPORT ON SPACE RESEARCH--SUBMITTED TO THE FIFTEENTH MEETING OF THE ICSU COMMITTEE ON SPACE RESEARCH (MADRID, 15 - 25 MAY, 1972). Report of ionosphere and space research in Japan, 1972 26(1/2), p.106-120, Bibliography p.118-120.

A general review of space research activity in Japan since May 1971 is given. Rocket, balloon, and satellite observations are described and the scientific results of the space research are summarized. Six sounding rockets of S210JA type were launched at night during the austral winter of 1971 at Showa Station. The experiment includes measurements of magnetic field, vertical distributions of electron density and temperature in the ionosphere, and X-rays, auroral ultraviolet radiation, and VLF emissions from the auroras for various grades of magnetic activity. Seven flights of sounding rockets are scheduled at Showa Station in 1972 for measuring auroral particles, auroral light, electron and ion densities, electric and magnetic fields, and auroral X-rays. S-210JA-12 rocket was launched on Feb. 11, 1972. A bibliography of space science is appended.

K-12175
Kokubun, S. , Makita, K., Hirasawa, T.
VLF-LF HISS DURING POLAR SUBSTORM. Report of ionosphere and space research in Japan, 1972 26(3), p.138-148, 22 refs.

There exist three categories of VLF hiss emissions in the auroral zone according to substorm condition and local time. Hiss emissions are often observed during the growth phase of substorms. The growth phase hiss is accompanied by a fluctuation in the brightness of auroral arc or band. Impulsive hiss bursts occur just before the onset of a substorm. This hiss burst is characterized by rapid intensity variations and a high frequency peak. In the evening region, hiss iis mostly observed during the expansion phase of a substorm. Intensity variations of evening hiss are not as rapid as those of hiss of the two former types. (Auth.)

K-12176
Iijima, T.
RELATIONSHIP OF MAGNETOSPHERIC SUBSTORMS ON THE GROUND AND IN THE DISTANT MAGNETOTAIL. Report of ionosphere and space research in Japan, 1972 26(3), p.149-157, 20 refs.

From a comparison of the simultaneous

magnetic disturbance-fields on the ground and in the distinct magnetotail for 64 isolated substorms, the following characteristics are statistically confirmed. The majority of magnetospheric substorms show a growth phase approx 1 hr preceding the grand expansion of auroral-electrojet field. (2) The growth phase is the stage wherein the magnetosphere configuration becomes strained and the storage of stain-energy proceeds by virtue of excess of energy-supply over energy-release in the magnetosphere. (3) The expansion phase is the stage wherein the strained magnetosphere collapses substantially so as to reveal a more stable configuration. (4) The two basic competing processes of energy-supply and energy-release proceed differentially in the magnetosphere during the course of a substorm, which appears as the qualitative difference between the growth phase and the expansion phase. Records of disturbance activity at Vostok and Byrd Stations have been used in the analysis.

K-12183
Cazeneuve, H.A.
AURORAL PULSATIONS IN MEAN FREQUENCIES. Pulsaciones aurorales en frecuencias medias. Buenos Aires. Instituto Antartico Argentino. Contribucion, 1971 No.143, 30p., In Spanish with English , French, German and Italian summaries. 30 refs.

The auroral intensity pulsations recorded with a photoelectric photometer at Base General Belgrano (77 deg 52 min S lat, 38 deg 24 min W long) are studied. These pulsations are over-imposed on a wave of greater period that is modulated with a still greater one. Five optical pulsation modes were identified. These are associated with the modulation period, the succeeding pulsation modes and the delta I/I parameter which is introduced to establish whether the pulsations are due to the modulation of the electron flux that precipitates, to fluctuations in the ionospheric plasma density, or to both effects. The periods of these modulations are grouped in several ranges. This fact is an indicator of the existence of several mechanisms that may trigger the optical pulsations. These mechanisms should operate independently and simultaneously in such a way that they couple in order to be stabilized or superimposed. The results are correlated with the auroral electron flux modulation resulting from the instability of the ionospheric plasma and the hydromagnetic waves. It is noted that the fluctuating electric fields present in the ionosphere should contribute to such complex modulation. Furthermore, it is pointed out that the pulsating events show a strong dependence on solar activity which is evident by the pulsating phases variation according to magnetic activity. Latitude and time distributions of the pulsating phases are obtained as a first step in the auroral oval dynamics. (Auth.)

K-12186
Gomez, J.G.
ARGENTINE CONTRIBUTION TO THE OBSERVATION OF AURORAS IN THE SUBAURORAL AND EXTRA-AURORAL REGIONS. Contribution Argentina a la observacion de auroras en la region subauroral y minauroral. Buenos Aires. Instituto Antartico Argentino. Contribucion, 1971 No.124, 24p., In Spanish with English, French, German and Italian summaries. 20 refs.

The present paper presents 54 cases in which auroral phenomena have been observed from Argentine stations located at latitudes ranging from 68 S to 54 S (57 deg and 43 deg geomagnetic latitude), over the period from July 1, 1957, through Sept. 16, 1968, with associated geomagnetic and solar activity parameters for each of the events.

K-12199
Expedition Antarctique belge, 1960 , Dogniaux, R.
SOLAR RADIATION AT ROI BAUDOUIN STATION, 1960. Rayonnement solaire a la base Roi Baudouin. Annee 1960. Bruxelles, Imprimerie Hayez, 1962, 41p., In French.

Monthly tables give data on the duration of insolation and on global radiation received on a horizontal surface as determined by a Campbell-Stokes heliograph with a heater to prevent rime.

K-12242
Kopytenko, IU.A. , Raspopov, O.M., Troitskaia, V.A., Shlich, R.
SOME RESULTS OF AN ANALYSIS OF STABLE GEOMAGNETIC PC4 PULSATIONS AT A NETWORK OF STATIONS. Geomagnetism and aeronomy, 1972 (Publ. March 1973) 12(4), p.627-631, Translated from Geomagnetizm i aeronomiia, Vol.12, No.4, 1972. 5 refs.

The behavior of Pc4 pulsations at the magnetically conjugate points Sogra and Kerguelen and at a network of stations in the Northern Hemisphere is analyzed from the results of synchronous observations of short-period pulsations in the autumn of 1964 and the spring of 1966. Individual segments of the pulsation record are subjected to spectral analysis. On the basis of the behavior of the amplitudes of pulsations at the network of stations it is assumed that Pc4 are generated in magnetospheric resonators. The quality of these resonators does not usually exceed 10. The rate of energy dissipation by a resonator of this kind averages 50 quadrillion erg/sec and may amount to 10 percent or more of the total rate of dissipation of the energy of the belt of trapped radiation responsible for the DR-current during the recovery phase of a geomagnetic storm. (Auth.)

K-12243
Beloborodova, A.A. , Belikovich, V.V., Benediktov, E.A., Gusev, A.I., Los', B.P., Shabanov, IA.A.
CHARACTERISTICS OF SUNRISE PHENOMENA DURING PCA EVENTS. Geomagnetic and aeronomy, 1972 (Publ. March 1973) 12(4), p.662-664, Translated from Geomagnetizm i aeronomiia, Vol.12, No.4, 1972. 5 refs.

Higher daytime than nighttime values of anomalous radio-wave absorption in the ionosphere are typical of PCA phenomena. The transition from day to night and vice versa occurs in the range of solar zenith angles chi = 90-98 deg and is associated with variations in microprocesses taking place in the lower part of the ionospheric D-region. Some characteristics of this transition in PCA events at Tiksi, Loparskaya, and Vostok Stations are compared. Curves showing the dependence of anomalous absorption on chi at various frequencies during sunrise reveal a characteristic steplike growth of absorption at all stations which reflect the pattern of microprocesses in the lower part of the D-region that are common to polar and temperate latitudes. The main ionization source at temperature latitudes are galactic cosmic rays and at polar latitudes during PCA, solar cosmic rays.

See also:
A-10556,A-11648,A-11739,B-10869,
F-10236,F-10826,F-10975,G-10097,H-10903,
H-12034,I-10829,I-10896,I-11279,I-11334,
I-12038,J-10688,M-11479

L. TERRESTRIAL PHYSICS

L-10019
Ewing, J.I. , Ludwig, W.J., Ewing, M., Eittreim, S.L.
STRUCTURE OF THE SCOTIA SEA AND FALKLAND PLATEAU. Journal of geophysical research, Oct. 10, 1971 76(29). Contribution No. 1703, Lamont-Doherty Geol. Observatory, p.7118-7137
QC811.J6

The results of 57 seismic-refraction profiles recorded in the South Atlantic Ocean south of 47S are used to describe the gross structure of the Scotia Sea basins, the Falkland plateau, and, to a lesser extent, the North Scotia and South Sandwich ridges. The Drake passage and Scotia Sea basins have normal or nearly normal oceanic crust. Their floors are covered by 300-1000 m of sediment, except in a band in the western part, where the sediment cover is thin and nonuniform. There is direct correspondence between the position of low oceanic ridge, as defined by morphology, seismic refractions, magnetic lineations, and earthquake epicenters; this correspondence suggests that the band may represent young oceanic crust produced by seafloor spreading. Scouring or nondeposition due to strong bottom currents may also have reduced accumulation in this band. The Falkland plateau is a southward-tilted continental block capped by a thick wedge-shaped body of sediments, the top-most layers of which continue farther south to form the floor of the adjacent Falkland trough. The section beneath the Falkland trough is similar to a depressed or subsided oceanic crust overlain by 4 km of low velocity sediments. (Auth.)

L-10020
Cleary, J.R. , Hales, A.L.
PKIKP TIMES AND S STATION ANOMALIES. Journal of geophysical research, October 10, 1971 76(29), p.7249-7259, 20 refs.
QC811.J6

Least-squares analyses of P times are complicated by systematic errors in earthquake location and by the presence of azimuthal variations in the station anomalies. These effects are much smaller for PKIKP because of the almost vertical incidence of the rays at the surface, so that PKIKP times and station anomalies can be more reliably determined. An analysis of data from 18 earthquakes gave PKIKP times deviating from those of Bolt (1968) by up to 2 sec. The station anomalies resulting from the analysis correlate well with the P station anomalies derived previously. Data from observatory stations located at Auckland I., Macquarie I., South Sandwich Is., and South Georgia are used in the analysis.

L-10047
Kaminuma, K.
MICRO-EARTHQUAKES OBSERVED AT SYOWA STATION, ANTARCTICA. Antarctic record, March 1971 No. 40, p.65-73, In Japanese with English summary. 14 refs.

Small shocks like micro-earthquakes are recorded frequently at Showa Station. The small shocks are roughly classified into two types according to the initial motion, a sharp initial motion (type I) and a weak one (type II). Some shocks of type I have a clear S phase and the rest have a small S phase. A swarm of type II shocks is recorded once or twice a year. The swarm occurs only in the summer season. With the data of Feb. to Dec. of 1969, the Ishimoto-Iida constant of the shocks of type II was calculated as m = 1.99 using Utsu's formula. It is established by Mogi that "m" increases with the degree of heterogeneity of the medium and also with the degree of spatial variation in the stress distribution of the field. The movement of the continental ice is active in the summer season and the structure may become heterogeneous. Thus, it is concluded that the shocks of type II are iceshocks (or icequakes). On the other hand, if a natural earthquake occurs around Syowa Station, its "m" is estimated at about 1.4, because the area belongs to the geological province of Pre-Cambrian gneiss, a part of the east Antarctic shield which is one of the nonseismic regions on the earth.

L-10056
Vuyst, A. de
NEW CONCEPT OF CONTINENTAL DRIFT. La nouvelle conception de la derive des continents. Ciel et terre, May-June, 1969; Nov.-Dec., 1969; July-Aug. 1970 85(3);85(6);86(4), p. 129-160; 345-375; 269-298. In French. 74 refs.

Various hypotheses proposed since Wegener for the tectonic evolution of the Earth are reviewed, and evidence available in their support is discussed, with emphasis on paleomagnetic data. Earlier concepts of continental drift have now been replaced by those of plate tectonics. Illustrations include a chart by Bullard which shows six continental plates and directions of their present movement. Boundaries, especially of the Antarctic and African plates are found difficult to determine.

L-10085
Woollard, G.P.
CONTINENTAL STRUCTURE OF ANTARCTICA. Special Committee of the International Geophysical Year. Annals of the International Geophysical Year, 1967 Vol.44, p.122-143, 41 refs.
QC801.3.S6

Studies of continental structure indicate that there is no distinctive difference in crustal velocity values between western and eastern Antarctica, and both have values that are characteristic of the continents rather than the oceans. In terms of crustal thickness, both earthquake surface wave velocity dispersion studies, as well as Bouguer gravity anomaly values and the equivalent rock elevation values, indicate that the crust beneath eastern and western Antarctica is in keeping with that observed on all other continents for areas having the same surface elevation. It is, therefore, not necessary to postulate a different type of tectonic origin for the two physiographic divisions of the continent, although there may have been foundering of western Antarctica and eustatic uplift of eastern Antarctica. The fact that the mean elevation of the equivalent rock

surface is abnormal for the size of the continent suggests the latter. The persistence of an archipelago after removal of the ice and slightly subnormal crustal thickness in western Antarctica suggests the first. Attention is also called to possible differences in crustal structure beneath the Antarctic Peninsula.

L-10225
Eto, T.
SEISMIC STUDIES DURING THE JARE SOUTH POLE TRAVERSE. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.115-124, 2 refs

During the 1968-69 austral summer, the JARE South Pole Traverse party undertook a program of seismic investigation of the ice cap in the East Antarctic plateau area. Throughout the traverse, an attempt was made to measure the ice thickness at 27 stations by seismic reflection shooting at approximately 100 km intervals. Though reflection shooting yielded poor records, they are being analyzed. The phenomenon of prolonged surface noise on cold firn after the detonation was the major obstacle to unequivocal sounding of the ice cap. Refraction profiles were shot at five stations to determine variation in the velocity of seismic waves with depth in the upper transition zone from snow to ice. Velocity variations over the area are also of interest for the study of densification of the snow.

L-10227
Yanai, K. , Kakinuma, S.
MEASUREMENT OF GRAVITY ALONG THE TRAVERSE ROUTE SYOWA-SOUTH POLE. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.131-150, 1 ref.

During the JARE South Pole Traverse 1968-69, gravity measurements were taken with a LaCoste and Romberg gravimeter No. 11. Observations were made at 642 stations spaced at intervals of 4 to 8 km. The total drift between Showa Station and South Pole Station was 2.5 mgal. The mean drift in a day was 0.02 mgal. The linearity of the drift was generally good throughout. Gravity values and free air anomalies at all stations are tabulated. Bouger anomalies will be reported later.

L-10228
Kakinuma, S. , Ishida, T.
GEOMAGNETIC SURVEY ALONG THE TRAVERSE ROUTE SYOWA-SOUTH POLE. Japanese Antarctic Research Expedition. Scientific reports, March 1971, Special issue No.2, p.151-182

The magnetic surveys carried out during the JARE traverse 1967-68 between Showa-Plateau and the JARE traverse 1968-69 between Showa-South Pole are reported. Since the route to and from the South Pole was the same, it was possible to make observations at numerous points on this route. Stress was laid on the measurement of total intensity, in order to clarify the crustal structure under ice sheet. The observation results were compared with those of seismic investigations and gravity surveys. There is no large local magnetic anomaly area along the traverse route. The detailed analysis of data is under way. No reduction has been applied to the values given in the report.

L-10346
Wood, J.D.
GEOMAGNETIC OBSERVATORIES AT BYRD AND POLE STATIONS. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 228

Geomagnetic observatory operations at Byrd and Amundsen-Scott Stations included continuous recording on film of variation in declination and in the horizontal and vertical intensity components of the geomagnetic field, regular sensitivity calibrations for the recording instruments, and measurements at suitable intervals to determine the intensity and direction of the field at all times. Fuska normal magnetographs, suspension magnetometers, and quartz horizontal magnetometers were operated at both stations. In addition, a rapid run magnetograph, which extends the frequency range to approx 6 cycles per min, was operated at Byrd Station.

L-10347
Lander, J.F.
CIRCUMANTARCTIC SEISMICITY IN 1970. Antarctic journal of the United States, Sept.-Oct. 1971 6(5), p. 228-231, 1 ref.

Fewer hypocenters were located in the circumantarctic seismic belt in 1970 than in recent years. In all, 85 hypocenters were computed for the region south of 45S, raising to 1,275 the total number of hypocenters in this area since 1958. In recent years approximately 135 hypocenters per year had been located. However, no particular significance is attached to this apparent decrease in activity. The number of published hypocenters worldwide also decreased from 5,311 in 1969 to 4,253 in 1970. Eight large earthquakes (magnitude 6.0 or greater) occurred in the circumantarctic belt. Of the 85 shocks located in this period, 34 hypocenters, including all deep-focus events occurred in the South Sandwich Is. region. Eight earthquakes were located at depths between 70 and 140 km, the deepest focus determined in the region this year. The major earthquake on June 14 and its aftershocks occurred in a zone of low seismicity off the coast of Chile. A second major earthquake occurred June 15 near the eastern tip of Tierra del Fuego. A major earthquake of 7.0 magnitude occurring on Feb. 8, 1971 should prove to be one of the most important events recorded in Antarctica.

L-10376
Adams, R.D.
REFLECTIONS FROM DISCONTINUITIES BENEATH ANTARCTICA. Seismological Society of America. Bulletin, Oct. 1971 61(5), p.1441-1451, 12 refs.

Early reflections of the phase P'P' recorded at North American seismograph stations from nuclear explosions in Novaya Zemlya are used to examine the crust and upper mantle beneath a region of eastern Antarctica. Many reflections are observed from depths less than 120 km, indicating considerable inhomogeneity at these depths in the Earth. No regular horizons were found throughout the area, but some correlation was observed among reflections at closely-spaced stations, and, at many stations, reflections were observed from the depths of between 60 and 80 km, corresponding to a likely upper boundary of the low-velocity channel. Deeper reflections were found at depths of near 420 and 650 km. The latter boundary was particularly well-observed and appears to be sharply defined at a depth that is constant to within a few kilometers. The boundary at 420 km is not so well defined by reflections of P'P', but reflects well longer-periods PP waves, arriving at wider angles of incidence. This boundary appears to be at least as pronounced, but not so sharp as that near 650 km. The deep structure beneath Antarctica

presents no obvious difference from that beneath other continental areas.

L-10400
Kaminuma, K.
SEISMOLOGICAL BULLETIN OF SYOWA STATION, ANTARCTICA 1968-1969. Japanese Antarctic Research Expedition. Scientific reports. Seismology, Mar. 1970 No.6, 38p.

Seismological observations at Showa Station, Antarctica have been continued, using three-component HES and LP seismographs. The data of the respective seismic events interpreted on the seismograms include the date, identified phase name with sharpness indication and ground motion direction, arrival time in G.M.T., period of the phase in seconds, and amplitude in millimeters. The instrumental constants and magnification curve of HES seimographs are shown. The reading data were sent to USCGS throughout the wintering period.

L-10403
Kaminuma, K.
SEISMOLOGICAL BULLETIN OF SYOWA STATION, ANTARCTICA 1969. Japanese Antarctic Research Expedition. JARE data reports. Seismology, Nov. 1970 No.9, 62p.

Seismological observations at Showa Station were carried out using three-component HES and LP seismographs. The seismographs were installed on Precambrian gneiss at an altitude of 21 m MSL. The data of the respective seismic events interpreted from the seismograms include the date, identified phase name with its sharpness indication and ground motion direction, arrival time in G.M.T., period of the phase in seconds, and amplitude in millimeters. The instrumental constants and magnification curve of HES seismographs are shown. The reading data were sent to USCGS throughout the wintering period. HES seismographs were operated with the attenuation factor of 1/2 from May 30 to Dec. 31.

L-10405
Kaminuma, K. , Ishida, M.
EARTHQUAKE INTERPRETATIONS AT SYOWA STATION, ANTARCTICA. Japanese Antarctic Research Expedition. JARE data reports. Seismology, July 1971 No.12, 76p.

Jeffreys-Bullen (1958) and Gutenberg-Richter (1953) travel time tables were used in this study. The earthquakes treated in this paper occurred during the period from 1967 to 1969, and the seismograms are mainly the contact copies of HES seismograms. For the explanation of the phases, the seismograms of P and S waves are partially enlarged and arranged with the contact copies. The contact copies of long-period seismograms in 1968 are also arranged. Instrumental constants and magnification curves of HES and LP seismonographs are shown. The LP seismograph was operated only in 1968.

L-10463
McKenzie, D. , Sclater, J.G.
EVOLUTION OF THE INDIA OCEAN SINCE THE LATE CRETACEOUS. Geophysical journal, Dec. 1971 24(5), p.437-528, 108 refs.

All available ship and aeroplane tracks across the Indian Ocean were searched for identifiable magnetic anomalies and transform faults, and hence the age and direction of motion at the time of formation of about two-thirds of the floor of the ocean established. The magnetic lineations show that India moved away from Antarctica at about 18 cm/y for 20 my in the Early Tertiary. This rapid motion ceased in the Eocene and was followed by the period in which little or no spreading took place west of the Ninety East Ridge. Australia separated from Antarctica during this period. The present spreading episode began about 36 my ago. This detailed study has permitted instantaneous poles of rotation to be obtained, and has established that Africa is now moving northward at 2 cm/y relative to Antarctica in the South West Indian Ocean. The evolution of the triple junction between the South East, South West and Central Indian Ridges is clearly reflected in the topography and magnetic lineations. The proposed evolution agrees with the distribution of known continental fragments and with the Late Cretaceous palaeomagnetic poles from surrounding continents and one obtained from the shape of the magnetic lineations south of India. It is, however, not yet clear how to reconstruct Gondwanaland from the Late Cretaceous reconstructions.

L-10470
Nagata, T.
MAGNETIC FIELD OF THE EATH IN THE PAST. Magnitnoe pole Zemli v proshlom. Nauka i chelovechestvo, 1965, p.168-175, In Russian

The magnetic field of the Earth, the North Magnetic Pole located at 78 N and 64 W, and the South Magnetic Pole at 78 S and 116 E, protects the Earth from solar winds. Geomagnetic charts, thermoremanent magnetiziation of volcanic rocks, and the C-14/C-12 ratio in the atmosphere for periods of 130, 6,000, and 2,500,000 yrs were studied and the direction, variations, and strength of the geomagnetic field, as well as magnetic polar wandering during these periods are discussed. It is estimated, that the South Magnetic Pole moving with a speed of 2 m per hr towards the Indian Ocean and being influenced by the so-called South-African anomaly will be located in South Africa in about 200 years.

L-10490
Gill, P.J.
MAGNETO-TELLURIC RESULTS FROM SCOTT BASE. New Zealand journal of geology and geophysics, Sept. 1971 14(3), p.547-563, 21 refs.

The amplitude ratio E/B for the earth current and magnetic variations at Scott Base has been determined over the period range of 30s to 30,000s. The distortion of the electric field by the land and sea in the neighborhood of Scott Base is estimated and an equivalent E/B curve is derived for a horizontally uniform medium. A magneto-telluric interpretation of this curve gives the thickness of the poorly conducting outer layer of the earth as 100 km, but other evidence suggests that this is an underestimate. (Auth.)

L-10527
Schneider, M.M.
FIRST OBSERVATIONS OF GRAVITY TIDES IN THE CENTRAL PART OF ANTARCTICA. Erste Beobachtungen der Schweregezeiten in der zentralen Antarktis. Gerlands Beitrage zur Geophysik, 1971 80(6), p.491-496, In German with English summary. 14 refs.
QC801.B3

Tidal variations of gravity observed at Vostok Station from July to Dec. 1969 were recorded by means of the Askania Gs 11 gravimeters. The low temperature in the vicinity

and electrostatic effects produced peculiarities in the experimental work. The preliminary mean harmonic constants of the O1 and K1 waves, according to five months analyses, are near 1.20. (Auth. mod.)

L-10529
Frolov, A.I.
ANTARCTIC CONTINENT ACCORDING TO GEOPHYSICAL INVESTIGATIONS. Materik Antarktida po dannym geofizicheskikh issledovanii. Moskva, Nauka, 1971, 84p., In Russian with English summary. 174 refs.

An analysis of the available data on geophysical investigations in Antarctica is presented in 6 chapters as follows: (1) Geological and geophysical studies: (a) General data on geology of the continent, (b) Seismic, gravimetric, and hypsometric surveys; (2) Gravity field: (a) Gravity field of the Faye and Bouger anomalies, (b) Dependence of anomalies on altitude, (c) Field of regional anomalies; (3) Rock relief of Antarctica: (a) Altitudes of the glacier bed from seismo-gravimetric data, (b) Structure of the subglacial relief and the thickness of outer masses; (4) The form of the geoid surface; (5) Isostasy: (a) General data on isostasy in Antarctica. (b) Gravity field of isostatic anomalies, (c) Field of regional isostatic anomalies of the geoid; degree of compensation of different regions; and (6) The crust of Antarctica: (a) General problems in crustal studies. (b) Thickness of continental and submarine crusts, and (c) Crustal structure and rock density.

L-10536
Opdyke, N.D.
PALEOMAGNETISM OF DEEP-SEA CORES. Reviews of geophysics and space physics, Feb. 1972 10(2), Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1734, p.213-249, 65 refs.
QC801.R46

Principal developments within the last six years in the paleomagnetic study of marine sediments are reviewed. Recent work utilizing the reflecting-light microscope indicates that detrital high-temperature Fe-Ti oxides are probably responsible for most of the magnetic remanence in marine sediments. It is possible to use the standard magnetic stratigraphy for the last 4 m.y. of earth history derived from terrestrial lavas and by extrapolation and interpolation, to better determine the ages of the major events. Through the use of long cores from the central Pacific and through correlation using fossil datums, it has been possible to extend the magnetic stratigraphy back to the upper middle Miocene to magnetic epoch 5. It is shown that the field of the earth averages to an axial-dipole field within a period of 27,000 years and that the field over the last two million years has acted as a geocentric axial dipole. Antarctic cores have been used in investigations of magnetic inclination to determine the behavior of the earth's dipole field and to demonstrate the use of magnetic stratigraphy to correlate faunal zones with different fossil groups and varying lithologies.

L-10554
Kapitsa, A.
DEFLECTIONS OF THE EARTH'S CRUST. Progiby zemnoi kory. Chelovek i stikhiia, 1967, p.111, In Russian.
QC851.C39

Gravimetric measurements made in Antarctica and compared to data from other continents show the occurrence of glacial isostasy, i.e., depression of the Earth's crust under the weight of the ice cover. Values of deflection for various areas of Antarctica calculated from data on ice thickness indicate slow warping of the crust that is still in progress. The relationship between subglacial warping during ancient glaciations and the surface of the ice cover reveals the effects of different forms of subglacial relief on the ice cover.

L-10577
Kaminuma, K.
SEISMOLOGICAL OBSERVATION AND THE EARTHQUAKE DETECTION CAPABILITY OF SYOWA STATION, ANTARCTICA. Tokyo University. Earthquake Research Institute. Bulletin, May 1969 47(3), p.453-466, 8 refs.
QE531.T6

Seismological observations were carried out at Showa Station (SYO), Antarctica, the JARE (Japanese Antarctic Research Expedition) using HES seismographs of three components. Determination was made of the number of earthquakes reported in the summary report of USCGS which were detected as P or PKP phase at SYO during the period from Mar. to Dec. 1967. The earthquake detection capability in connection with the magnitude and the epicentral distance was investigated. The detection capability of SYO is 7 percent in winter and 2 percent in summer. These values are the same order as those of Dumont d'Urville and Mirnyy, but very low as compared with that of South Pole Station. The detection capability for distance range around 30 deg is clearly low and it can be considered that there is some relation between the detection capability and P-wave amplitude. (Auth.)

L-10586
Valencio, D.A. , Vilas, J.F.
PALAEOMAGNETISM OF SOME MIDDLE JURASSIC LAVAS FROM SOUTH-EAST ARGENTINA. Nature, Jan. 17, 1970 225(5229), p.262-264, 13 refs.
Q1.N2

On the basis of paleomagnetic studies of Argentine lavas in the Triassic it has been suggested that South America and Africa started to drift apart before the middle Cretaceous. Paleomagnetic studies of Jurassic rocks from South America indicate that the fragmentation of the South American-African block and the formation of the South Atlantic Ocean and the Argentine Basin began in Lower Jurassic times.

L-10592
Creer, K.M. , Mitchell, J.G., Abou Deeb, J.
PALAEOMAGNETISM AND RADIOMETRIC AGE OF THE JURASSIC CHON AIKE FORMATION FROM SANTA CRUZ PROVINCE, ARGENTINA: IMPLICATIONS FOR THE OPENING OF THE SOUTH ATLANTIC. Earth and planetary science letters, Feb. 1972 14(1), p.131-138, 13 refs.
QE1.E12

At Camarones Bay, the Chon Aike formation of rhyolites, andesites and porphyries exhibits normal remanent magnetization at nine sites and reversed remanence at eight sites. A K-Ar age of 166 my was obtained from a pair of determinations on each of ten samples. This puts the emplacement of these lavas in the Bathonian Stage of the Middle Jurassic. The reversed magnetization may therefore correspond to the Pospelovskaja Reversed Zone in the predominantly normal Jurassic geomagnetic field. The mean

direction of the normal group of sites is the same as that already reported for normally magnetized samples from Puerta Deseado, but the reversed group yields a different mean direction. A single population formed of the two sets of VGPs falling near the present south poles has a mean of a post Jurassic opening of the South Atlantic. (Auth.)

L-10671
Hill, D.W.
EVALUATION OF THE 1965.0 EPOCH, H.O. 1706 WORLD MAGNETIC VARIATION CHART. U.S. Naval Oceanographic Office. Hydrographic Development Division. Technical report, June 1968 TR-207, 306p., 2 refs.

An evaluation of the 1965.0 epoch, H.O. 1706 World Magnetic Variation Chart is performed by direct comparison of charted and observed values. Estimates of chart reliability based on the correlation of the computed spherical harmonic surface and individual field data values are included for the south polar area. For the high latitudes, which are represented by less than 50 data points per chart, covering 4 deg of lat. and variable range of long., the error exceeds 0.5 deg. A World Aeronautical Chart index and a chart of Areas of High Residuals and No Data are given. Tables show data density and distribution and comprise mainly the area histograms and associated statistics.

L-10672
Irving, E.
PALEOMAGNETISM AND ITS APPLICATION TO GEOLOGICAL AND GEOPHYSICAL PROBLEMS. New York, John Wiley & Sons, 1964, 399p., Refs.
QC827.I7

The present knowledge of paleomagnetism is summarized and its relation outlined to geology and earth physics. Graham Land, South Victoria Land, Heard, Kerguelen, South Sandwich, and South Shetland Is., Theron Mt., other locations in the Antarctic region and Gondwanaland are locales where studies have been made on the geophysical aspects dealing with time variations in the Earth's magnetic field, the physical and mineralogical aspects in the origin of fossil magnetism, and the geological aspects in paleomagnetic observations compared with geological results. The development of statistical techniques for data reduction, mechanisms by which rocks can acquire a remanent magnetization, and the techniques of calculating paleomagnetic poles are discussed as potentialities and limitations of paleomagnetic work.

L-10690
Schlich, R. , Gadat, F., Segoufin, J.
LA COUR MAGNETOGRAMS, PORT-AUX-FRANCAIS (KERGUELEN) 1964. Magnetogrammes La Cour. Port-aux-Francais (Kerguelen) 1964. Comite national francais des recherches antarctiques. CNFRA, 1971 No.28, 197p., In French. 5 refs.
QE350.C62

Two pages of explanatory text accompany reproductions of the original magnetograms obtained at Port-aux-Francais during 1964. In addition to the three tracings for H, D, and Z, an auxiliary line representing temperature variations is given, in order to facilitate temperature corrections. Analyzed values extracted from these records are to be published.

L-10731
South Africa. Dept. of Lands
RESULTS OF MAGNETIC OBSERVATIONS MADE AT SANAE STATION, 1964. Hermanus, South Africa. Magnetic Observatory. Report, June 1966 No.B.6, Geophysical series I, 65p.

Geomagnetic observations at SANAE Station were recorded with a La Cour normal-run (15mm/hr) storm magnetograph. Instruments used for absolute observations included two quartz horizontal-force magnetometers, a modified La Cour magnetometric zero balance, and an Elsec proton precession magnetometer. The mean hourly values, and the daily means and extreme value of declination, horizontal intensity, and vertical intensity are tabulated. Mean diurnal variations are also given.

L-10732
South Africa. Dept. of Lands
RESULTS OF MAGNETIC OBSERVATIONS MADE AT SANAE STATION, 1966. Hermanus, South Africa. Magnetic Observatory. Report, June 1968 No. B.9, Geophysical series I, 41p.

Recording of geomagnetic data at SANAE Station using a La Cour normal-run (15mm/hr) storm magnetograph and a fluxgate magnetometer continued throughout the year. Routine determinations of horizontal intensity and declination were made with two quartz horizontal-force magnetometers, and vertical intensity was measured with a magnetometric zero balance. Field observations were carried out at selected stations on the traverse route from SANAE to Nunatak 1810. Mean hourly values, daily means, and extreme values of the magnetic elements are tabulated.

L-10741
Dewart, G.
MAGNETIC PROFILE IN THE GERLACHE STRAIT, ANTARCTICA. RF Project 2264 Report no. 1, Ohio State University, Research Foundation, April 1972, 8p., 9 refs.

During a voyage of the Westwind in March 1967 a profile of the total magnetic field was obtained along a 208 km track in Gerlache Strait, a tectonic depression off the west coast of the Antarctic Peninsula. There is no direct correlation between bottom topography and magnetic intensity. A very low magnetic gradient exists where the profile parallels the regional tectonic trend. Sharp anomalies occur where the profile crosses the tectonic trend. (Auth. mod.)

L-10786
Knopoff, L. , Leeds, A.
LITHOSPHERIC MOMENTA AND THE DECELERATION OF THE EARTH. Nature, May 1972 237(5350), p.93-95
Q1.N2

Deceleration as a mechanism for lithospheric dynamics can be determined if the lithosphere has an axial component of angular momentum relative to the lower mantle, in a sense opposite to that of the ordinary spin angular momentum. The analysis requires the existence of an inertial frame of reference fixed in the lower mantle which, for the purposes of this study, can be provided by the Antarctic plate due to its approximate symmetry relative to the axis of rotation. The relative velocities of 10 lithospheric plates are recalculated: Europe, Africa, America, China, Pacific, Philippine, Indian, Cocos, Nazca, and Antarctica. The poles of rotation for the relative motions and angular velocities of spreading are given for all 45 combinations of plate pairs. The angular

momentum of all the plates calculated relative to the Antarctic plate in units of HSL cm/hr is (15.3, 15.6, and -73.0). A westward drift of the lithospheric plates relative to Antarctica is indicated, more than one-half of the total being contributed by the motion of the Pacific plate relative to Antarctica. The mean axial component of velocity of drift is 2.3 cm/hr. It is concluded that deceleration cannot be disregarded as a possible cause of driving lithospheric plate motions although the cause of the deceleration remains unknown.

L-10824
Solov'ev, D.S. , Kogan, A.L.
DEEP SEISMIC SOUNDING IN QUEEN MAUD LAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.501-503, Translated from its Informatsionnyi biulleten' No.77, 1970. 3 refs.
Q115.S6862

Geophysical investigations carried out by the 14th Soviet Antarctic Expedition during the 1968-69 summer were done to study the thickness and structure of the Earth's crust in Queen Maud Land. The party performed deep seismic soundings (DSS), soundings by the reflected wave method (RWM), gravimetric observations, measurements of the vertical magnetic field component, and barometric leveling on a 425-km linear profile, crossing the Schirmacher Ponds and striking SE along an azimuth of 102 deg. The region investigated belongs to the crystalline basement of the pre-Riphean platform, developed here in the two continental coastal and shelf zones. The results of a preliminary analysis of the investigations are reported and some of the methods used are discussed. Conclusions confirm the feasibility of using deep seismic soundings supplemented by aerial soundings; give a representation of the crustal structure, subglacial relief, and boundaries between the continental and transitional crusts; and claim verification of predictions on crustal thickness.

L-10836
Medvedev, N.D.
SECULAR VARIATION OF MAGNETIC DECLINATION IN THE SOUTHERN OCEAN AND DRIFT OF THE SOUTH MAGNETIC POLE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.535-541, Translated from its Informatsionnyi biulleten' No.77, 1970. 21 refs.
Q115.S6862

The values of magnetic declination, D, obtained in the Southern Ocean in 1819-21 by the First Russian Antarctic Expedition were compared to the D map constructed for the 1960-65 epoch at the Leningrad Branch of the Institute of Terrestrial Magnetism, Ionosphere, and Radio Wave Propagation. Data on the total differences, D, over 145 yrs, from these two sources show that in 60 out of 89 cases the discrepancy in the values of the secular pattern does not exceed 4 min and in 36 of these it is only one min. According to observations the average drift velocity of the South Magnetic Pole (SMP) is about 12 km/yr, while according to computed data since 1600, the average annual drift velocity is approx. 10 km. The period of revolution of the SMP is called the pole cycle, which lasts 3800-4000 yrs along an orbit 46,000-48,000 km long. The dynamics of the magnetic center around the inner core of the Earth, and consequently the drift of the magnetic poles, affect the global distribution of the magnetic field, its regional and local characteristics, and intensity with time.

L-10853
Rivin, IU.R.
RECORDING OF EARTH CURRENTS AT MIRNY OBSERVATORY. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Jan. 1972 7(6), p.601-602, Translated from its Informatsionnyi biulleten' No.78, 1970. 2 refs.
Q115.S6862

Earth current components were recorded in sequence on lines of different lengths at Mirnyy Station in 1968. The main lines (N-S and E-W), 100 m long, were laid out on the ice along the geographic meridian and latitude about 80-100 m from the coastline. The Earth currents were recorded by a three-electrode circuit with a common "SE" electrode. Additional S and E electrodes extended 25 m toward the coast from the "SE" electrode along the corresponding lines. The occurrence of proportional and "anomalous" fluctuations in the components recorded is discussed, the anomaly presumably being produced by a coastal effect.

L-10870
Kaminuma, K. , Ishida, M.
EARTHQUAKE ACTIVITY IN ANTARCTICA. Antarctic record, Dec. 1971 No.42, p.53-60, 12 refs.

The U.S. Coast and Geodetic Survey publication, The Antarctic Seismological Bulletin, contains phase readings received telegraphically from the Antarctic seismological stations. Using data reported in the bulletin for the period 1966-69, one event occurring on June 26, 1968 was located in the Antarctic Continent near 20 W and 80 S. The stations used for the focal center determination were SANAE, South Pole, Byrd, and Mawson. This may be the first evidence of an earthquake occurrence in Antarctica.

L-10879
McElhinny, M.W.
NOTES ON PROGRESS IN GEOPHYSICS. PALAEOMAGNETIC DIRECTIONS AND POLE POSITIONS--XII. POLE NUMBERS 12/1 TO 12/180. Geophysical journal, May 1972 27(3), p.237-257, 61 refs.
QC801.G382

Paleomagnetic data are compiled in two parts. The first table lists a number of corrections to the four previous lists (VIII to XI). In each case the entry has been listed again in its correct form, and changes from the original entry are indicated. The second table contains new results published approximately up to the end of 1970. The results in the main list are presented in 20 columns, including country, identification numbers, information about the rock units, symbols referring to the age of the rock units, stratigraphic thickness covered by the samples, the spread, numbers and specimens of samples, stability results, natural remanent magnetization, percentage of positive and negative polarizations; estimates of the mean directions of magnetization, estimates of the precision and error of observations, northern hemisphere coordinates of the paleomagnetic poles, and the elliptical errors round the poles. Data are included for rock units in the South Sandwich Is., South Shetland Is., and Western Dronning Maud Land.

L-10889
Valencio, D.A. , Vilas, J.F.
PALAEOMAGNETISM OF LATE PALAEOZOIC AND EARLY MESOZOIC ROCKS OF SOUTH AMERICA. Earth and planetary science letters, 1972 15(1). p.75-85,

34 refs.
QE1.E12
Further geological evidence and radiometric studies of South American igneous rocks suggest, (i) a Middle Permian age for geomagnetic poles until now quoted as Permo-Triassic or Lower Triassic, and (ii) a Middle-Upper Triassic age for a geomagnetic pole previously quoted either as Middle or Upper Triassic. The paleomagnetic and radiometric data from igneous rocks of the Quebrada del Pimiento Formation of Argentina, define a period of normal polarity within the Late Paleozoic Interval of reversed geomagnetic polarity (Kiaman Magnetic Interval); the possibility of using this short normal period for geological correlation is suggested. The Late Paleozoic geomagnetic poles now available for South America define the polar path relative to this continent fairly well; it is suggested that this polar path is also valid for Africa, South America and Africa having been joined by their Atlantic margins throughout the Late Paleozoic and Triassic. The discrepancy between the positions of Permian geomagnetic poles of South America and Australia is pointed out. It could represent different polar shifts relative to South America and Australia and could imply that the fragmentation of Gondwana started in Early Permian times with the formation of two supercontinents: South America-Africa and Australia-Antarctica-India. (Auth.)

L-10895
Kogan, A.L. , Morozov, E.E.
GEOLOGICAL INTERPRETATION OF MAGNETIC MEASUREMENTS ALONG AN INLAND TRAVERSE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, April 1971 7(5), p.395-396, Translated from its Informatsionnyi biulleten' No.75, 1969. 1 ref.
Q115.S6862
The geological interpretation of data on seismic and magnetic investigations, carried out during the Molodezhnaya-Pole of Relative Inaccessibility traverse in 1967, is given. According to the variation of the vertical components of the magnetic field, the profile can be divided into two sections: 1) the first 750 km of the traverse, a complex structure, with a very rugged surface relief of the crystalline basement, which occurs at a comparatively shallow depth, 0-3.5 km; and 2) from 750 to 2300 km, a simple structure with crystalline basement of a more uniform structure and a less rugged surface relief, which occurs at a depth of 4-4.5 km. The existence of faults along the traverse is indicated by component changes.

L-10939
Valencio, D.A. , Embleton, B.J.J., Vilas, J.F.A.
RECONSTRUCTION AND EVOLUTION OF THE GONDWANA CONTINENT ON THE BASIS OF PALEOMAGNETIC AND SEA FLOOR SPREADING DATA. Reconstruccion y evolucion del continente Gondwana sobre la base de datos paleomagneticos y de la propagacion de los fondos de los oceanos. Associacion geologica Argentina. Revista, Feb.-Mar. 1971 26(1), p.5-23, In Spanish with English summary. 78 refs.
QE1.A7213
A critical analysis of paleomagnetic and sea floor spreading data is presented for each of the Gondwana continents, during the Palaeozoic, Mesozoic and Cenozoic. The exception is the position of Antarctica, which is defined from sea floor spreading data alone. The possibility that the morphology of Antarctica was distinct from that of present, until sometime in the Mesozoic, is implied by the paleomagnetic data. The fragmentation of Gondwanaland probably started in the lower Parmian or in the upper Permian with the formation of two large continental blocks, 1) South America-Africa and 2) Australia-Antarctica-India, and was finally completed during the Miocene with the definitive separation of Australia from Antarctica.

L-10957
Demenitskaia, R.M. , Ushakov, S.A.
CRUSTAL STRUCTURE OF ANTARCTICA. Antarctic (Antarktika), 1971, p.60-81, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 51 refs.
Several methods of geophysical investigations in the Antarctic and their respective accuracies are discussed. A survey of the literature on the subglacial relief, isostasy, and the earth's crust in Antarctica is presented. Despite the doubts of Woollard (1962) in the Soviet discovery of the subglacial Gamburtsev Range, subsequent investigation has established its existence, although the question of the direction of its trend remains open. The mean value of the isostatic anomalies for all investigated regions of Antarctica is close to -5 mgal, which indicates that the ice sheet is fully isostatically compensated. There are other corroborating indications of isostatic compensation, such as the great depth of the continental shelf, its sharp inclination toward the continent in many places, and the disjunctive dislocations on the continent's periphery. The mean thickness of the crust in East Antarctica ranges from 30 to 55 km, and in West Antarctica, from 20 to 44 km. (For Russian original see L-5041)

L-10970
Lazarev, G.E. , Ushakov, S.A., Bugaev, IU.G.
METHODS AND RESULTS OF GEODETIC AND GRAVIMETRIC STUDIES OF THE CENTRAL PART OF EAST ANTARCTICA. Antarctic (Antarktika), 1971, p.82-94, TT 67-59071, Translation from Antarktika: Doklady komissii, 1964. Moskva, Nauka, 1965. 7 refs.
Beginning with mean sea level at the Davis Sea, trigonometric leveling for 250 points along the oversnow traverses from Mirnyy to Vostok, Pionerskaya, Komsomol'skaya, and Sovetskaya Stations and to the Pole of Inaccessibility was performed. The Faye (free-air) anomalies were determined by SN-3 and Worden gravimeters at 350 points along this route; these anomalies are mapped, and lines are drawn connecting regional maximum and minimum values between adjacent traverses. The subglacial relief, as reflected by the free-air anomalies and indicated by other data, is mapped and isohypses are drawn at 500-m intervals. The crustal thickness is estimated from the Bouguer anomalies in accordance with known empirical relationships, and is found to increase from 33-35 km at the coast to 40-55 in the area of the subglacial Gamburtsev Range. For Russian original see L-4541.

L-11023
Tarling, D.H.
ANOTHER GONDWANALAND. Nature, July 14, 1972 238(5359), p.92-93, 15 refs.
Q1.N2
A new geometric reconstruction of Gondwanaland is proposed based on a southerly derivation of Madagascar instead of the northerly derivation required for the Smith and Hallam (1970; L-8790) and du Toit (1937) reconstructions. This fit, which is only to a first approximation, places Madagascar against

Mozambique; India close to rotated Madagascar; Australia close to Antarcitca; and both continents against India-Africa. In order to complete the "circumvallation" of Gondwanaland and to avoid overlap between Patagonia and the Antarctic Peninsula, it is necessary to unbend Patagonia slightly and to straighten the Antarctic Penninsula. These features are thought to have curled in the Tertiary and Cretaceous, respectively. It is also necessary to move West Antarctica relative to East Antarctica; this movement must have occured in the Jurassic and was presumable related to the eruption of the Jurassic Ferrar and Tasmanian Dolerites. Test of the reconstruction shows it to be consistent with the paleomagnetic evidence.

L-11030
Thompson, R.
PALAEOMAGNETIC RESULTS FROM THE PAGANZO BASIN OF NORTH-WEST ARGENTINA. Earth and planetary science letters, June 1972 15(2), p.145-156, 18 refs.
QE1.E12

The remanent magnetization of red sandstone and siltstone samples of Middle/Upper Carboniferous to Triassic age from four localities in the Paganzo Basin has been measured. Field and laboratory tests demonstrate the stability of the remanence of the thermally cleaned six formation results. The results span the Kiaman Reversed Magnetic Interval. The directions of magnetization confirm previous results from South America, but indicate that the available paleomagnetic results from the southern continents do not confirm, in detail, existing Gondwana reconstructions.

L-11042
Beck, M.E.
PALAEOMAGNETISM AND MAGNETIC POLARITY ZONES IN THE JURASSIC DUFEK INTRUSION, PENSACOLA MOUNTAINS, ANTARCTICA. Geophysical journal, May 1972 28(1), p.49-63, 58 refs.
QC801.G382

The Dufek intrusion, of the Pensacola Mountains, Antarctica, is a stratiform mafic complex consisting of layered gabbro with subordinate amounts of anorthosite, pyroxenite, and granophyre, forming a little deformed sheetlike intrusion at least 6 km thick. Its age is estimated as Jurassic. Of 183 oriented hand samples originally collected from the intrusion for paleomagnetic studies, 98 proved to be magnetically stable, including 61 samples of normal polarity, 30 of reversed polarity, and seven that are intermediate. The distribution of polarities within the intrusion makes it impossible to rule out either self-reversal or geomagnetic field reversal as the cause of the dual magnetic polarities; possibly both processes were operative. Both intensity of remanent magnetization and magnetic susceptibility generally increase with stratigraphic height in the intrusion. Mean directions of remanent magnetization for the two polarity groups are very nearly antiparallel, and when combined yield a south paleomagnetic pole at 56.5 deg S., 168 deg W., for the Dufek intrusion. This pole lies near poles previously reported for the Jurassic Ferrar dolerite. Available data are not sufficient to define the behavior of the pole in relation to Antarctica during most of the Mesozoic. Paleomagnetic evidence tends to support the proposition that West and East Antarctica were independent entities in pre-Tertiary time, and to suggest that there has been significant Tertiary movement of crustal blocks within West Antarctica.

L-11043
Watkins, N.D. , Hajash, A., Abranson, C.E.
GEOMAGNETIC SECULAR VARIATION DURING THE BRUNHES EPOCH IN THE INDIAN AND ATLANTIC OCEAN REGIONS. Geophysical journal, May 1972 28(1), p.1-25, 50 refs.
QC801.G382

Brunhes epoch secular variation in the Atlantic and Indian Ocean regions, including Amsterdam and Crozet Is., has been examined using available and unpublished palaeomagnetic results from igneous rocks. Specimens from 401 separate units, all of which have unstable components minimized, are involved. More than half of these data are previously unpublished. The data are classified as first order when the mean direction for each body is derived from at least four separate specimens, and second order when the number of specimens per body is not considered. Geomagnetic palaeosecular variation models are examined in terms of the latitude dependence of angular dispersion (S) of virtual geomagnetic poles (VGP's). Values of S from second order data, while exhibiting wide 95 per cent confidence intervals, increase with latitude. First order data also yield S values increasing with latitude, and are sufficiently well defined to indicate that S may have increased more rapidly with latitude during the Brunhes Epoch than at present. While the simple diode wobble model for the geomagnetic field is clearly excluded by the results, no distinction can be made between other current models, and the possibility of the existence of a region of attenuated Brunhes epoch non-dipole activity in the west-central Indian Ocean cannot be excluded.

L-11073
Nakagawa, I. , Kakinuma, S., Yanai, K., Endo, Y.
OBSERVATION OF TIDAL VARIATION OF GRAVITY MADE IN SYOWA STATION, ANTARCTICA. International Symposium on Earth Tides, 6th, Strasbourg, 1969, [Bruxelles] Observatoire Royal de Belgique, 1970, p.16-19, N72-10279, Symposium held in Strasbourg Sept. 15-20, 1969. Also designated as Communications, Serie A, No. 9 and Serie Geophysique No. 96 of Observatoire Royal de Belgique.
QC809.E2I58

Tidal variation of gravity was observed in Syowa Station, Antarctica, by means of a LaCoste gravimeter G-118. Visual readings were made at about one hour intervals during a period of 7 days from June 18 to June 25, 1968 (UT). The number of readings obtained was 169. The data obtained and the corresponding computed tides on a perfectly rigid earth were analyzed by the least square method and compared with each other. It was found that the tidal factor of gravity and phase lag are 1.376 and -3 deg 73 deg for the K constituent and 1.145 and -3 deg .16 deg for the O constituent, respectively.

L-11074
Kogan, A.L. , Stroev, P.A.
GRAVIMETRIC OBSERVATIONS IN THE LAZAREV AND NOVOLAZAREVSKAYA STATION AREAS. Gravimetricheskie issledovaniia v raione sovetskikh antarkticheskikh stantsii Lazarev i Novolazarevskaia. Moscow. Universitet. Gosudarstvennyi astronomicheskii institut. Trudy, 1972 43(2), p.3-7, In Russian with French summary. 7 refs.

Gravimetric surveys by the Soviet Antarctic expeditions in Lazarev Bay and on Princess Astrid Coast in 1959-1964 and 1969 are described. Data on gravity measurements obtained from 41 areas on

the glacier ice in 1969 are examined and tabulated.

L-11076
Neuman, L.D. , Talwani, M.
ACCELERATIONS AND ERRORS IN GRAVITY MEASUREMENTS ON SURFACE SHIPS. Journal of geophysical research, Aug. 10, 1972 77(23), Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1827, p.4330-4338, 11 refs.
QC811.J6
Typical samples of ship accelerations are used to examine errors in gravity measurement at sea. Ships experience large vertical (heave) accelerations that must be filtered out in order to obtain accurate measurements from a gravimeter mounted on a stabilized platform. Four heave filters designed to reduce such accelerations to <1 mgal while not affecting the gravity signals are examined. The off-leveling that depends on the erection loop of the gyro was also determined for most of the gyrostabilized platforms in use. Fourier analysis of sway and surge acceleration recorded aboard the Vema, Robert D. Conrad, and Eltanin were used in the determination.

L-11108
Snape, C. , Retief, J.A.
PALAEOMAGNETIC STUDY OF SOME RECENT LAVAS. Marion and Prince Edward Islands; report on the South African Biological and Geological Expedition, 1965-1966, Cape Town, Balkema, 1971, p.63-71. Includes an appendix on three samples of lava from Bouvet Island. 9 refs.
QH199.5.S68
Palaeomagnetic studies on seven samples of recent lavas from Marion I. and three from Prince Edward I. give a mean direction of magnetization not significantly different from that of the theoretical axial dipole field. The precision of the mean was increased after alternating field demagnetization. All the samples were normally magnetized.

L-11217
Avsiuk, IU.N. , Bulanzhe, IU.D.
INITIAL GRAVIMETRIC BASES IN ANTARCTICA. Geophysical bulletin, 1966 No.13, p.45-46, Translated from Geofizicheskii biulleten' No.13:41-42, 1963.
The gravimetric base station in Antarctica for the USSR is Mirnyy. SN-3 gravimeters were used to determine increments of the force of gravity between intracontinental Soviet Antarctic stations. The results of these determinations reduced to the g-value for Mirnyy obtained by Sparkman, are tabulated. Measurements are made on snow runways at the stations, so that corrections must be introduced to account for snow accumulation and transport. The Aerogravimetric Laboratory of the Institute of Geophysics of the Academy of Sciences of the USSR issued a comprehensive catalog of all gravimetric stations established in the Antarctic to Jan. 1, 1962. For Russian original see L-1326.

L-11230
NEW SEISMOLOGICAL STATION AT THE O'HIGGINS STATION. Nueva estacion sismologica de Base "O'Higgins". Santiago de Chile. Instituto Antartico Chileno. Boletin, 1969 No.4, p.42-44
On Feb. 9, 1969, a new seismological station was inaugurated at O'Higgins Station. It will complement the seismological observations made at O'Higgins since 1954. The equipment includes 3 Press-Ewing long-period and 3 Benioff short-period seismographs oriented in N-S, E-W and vertical directions with galvanometric recording on photographic paper. Time will be controlled by a quartz crystal clock. The usefulness of this station was shown during the Deception Island eruption on Feb. 21, 1969, the seismic waves of which were clearly recorded.

L-11245
Weissel, J.K. , Hayes, D.E.
MAGNETIC ANOMALIES IN THE SOUTHEAST INDIAN OCEAN. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1778, p.165-196, 57 refs.
GC461.A58
A detailed pattern of magnetic anomaly lineations has been mapped for the area south of Australia and for the South Tasman Sea. The distribution of magnetic anomaly amplitudes and their relationship to geographical zones and to inferred age are described on the basis of contrasts in magnetic, morphologic, and seismic properties. Significant differences in the natural remanent magnetization of the oceanic crust are inferred for the Indian and Antarctic plates in this area. The most striking difference is that the amplitudes of certain lineations are greater over the Indian plate than over the Antarctic plate. Magnetic inclinations associated with anomalies on the Indian plate appear to be about 20 deg lower than their counterparts on the Antarctic plate. The history of relative motion of Australia and Antarctica is described in terms of a series of sequential rotational poles that are calculated from magnetic lineations and complementary morphologic information. Magnetic quiet zones, together with auxiliary geologic and geophysical data provide important constraints on the time and nature of the earliest rifting.

L-11246
Christoffel, D.A. , Falconer, R.K.H.
MARINE MAGNETIC MEASUREMENTS IN THE SOUTHWEST PACIFIC OCEAN AND THE IDENTIFICATION OF NEW TECTONIC FEATURES. American Geophysical Union. Antarctic research series, 1972 Vol.19, Columbia University. Lamont-Doherty Geological Observatory. Contribution No. 1779, p.197-209, 27 refs.
GC461.A58
Analysis of 41 magnetic profiles in the southwest Pacific has enabled the pattern of magnetic anomaly correlations in the area to be clarified and extended. The time scale for sea floor spreading recognizable by characteristic magnetic anomalies has been increased from 76 to 81 m.y. It is deduced that West Antarctica and New Zealand rifted just prior to 81 m.y. ago. Distinct periods of sea floor spreading can be identified with ddifferent poles of rotation for the motion between the Pacific and antarctic plates. South of New Zealand, the Albatross cordillera becomes a fracture zone at least 1200 km long, and it is proposed that this section be named the Pacific-Antarctic fracture zone. A revised pole of 82 deg S, 120 deg E is suggested for the present Pacific-antarctic pole of rotation.

L-11248
Christoffel, D.A. , Van der Linden, W.J.M.
MACQUARIE RIDGE-NEW ZEALAND ALPINE FAULT TRANSITION. American Geophysical Union.

Antarctic research series, 1972 Vol.19, p.235-242, 16 refs.
GC461.A58

In the Fiordland-Puysegur trench region, there are discrepancies between observation and the present concepts of plate movements. The southeast dipping Benioff zone strikes parallel to the transform Alpine fault and therefore appears to be in the wrong direction. To overcome this apparent difficulty, an inverted plough model is proposed for the subduction zone. In this model, the Benioff zone is broken into relatively narrow sections by a number of transform faults. Each section rotates as it sinks. The leading edges incline toward the vertical and run in the transform direction. The depth of the earthquakes is related to the width of the plough furrow.

L-11249
Williamson, P. , Rubenach, M.J.
PRELIMINARY REPORT ON GEOPHYSICAL STUDIES ON MACQUARIE ISLAND. American Geophysical Union. Antarctic research series, 1972 Vol.19, p.243-249, 12 refs.
GC461.A58

A simple Bouguer gravity map of Macquarie I. shows a gradient of approximately plus 5 mgals/km in a westerly direction. No locally significant Bouguer anomalies were observed within the confines of the island. The amplitudes and wave lengths of magnetic anomalies on Macquarie I. are similar to those observed near the ocean floor from deep-tow magnetometer studies. The amplitude of anomalies and the noise level of the magnetic profiles are related to the underlying rock types and to their degree of metamorphism. Relatively high noise levels are observed on magnetic profiles over volcanic and ultramafic rocks. The magnetic noise is related to observed variations in low grade metamorphism and to serpentinization. The dyke swarms, which are mainly restricted to the northern part of the island and are metamorphosed to greenschist and amphibolite facies, are associated with relatively low noise level magnetic signatures. Correlations between magnetic profiles in the central and southern parts of the island indicate a magnetic fabric striking northwest to north-northwest, and this trend coincides with the dominant regional strike of geologic features. Results from this study do not support the hypothesis that Macquarie I. was formed by crustal extension at the Macquarie ridge.

L-11341
Koriakin, E.D. , Stroev, P.A., Frolov, A.I.
RESULTS OF GRAVIMETRIC SURVEYS IN ENDERBY LAND (EAST ANTARCTICA). Rezul'taty gravimetricheskikh issledovanii na Zemle Enderbi (Vostochnaia Antarktida. Morskie gravimetricheskie issledovaniia, 1970 Vyp.5, p.83-95, In Russian. 17 refs.
QB335.M6

Gravimetric studies were carried out by Russian and Japanese Antarctic expeditions in Enderby Land between 65 deg and 70 deg 5 min S and 36 and 60 E since 1956. The data are presented in charts of gravity anomalies and in a table showing 327 gravity points, their coordinates, elevations, sea depths, values, free air and Bouger anomalies and comments. The methods and instruments used for gravity measurements are discussed.

L-11342
Frolov, A.I. , Stroev, P.A., Koriakin, E.D.
GRAVITY FIELD AND CRUSTAL STRUCTURE OF WILKES AND VICTORIA LANDS (EAST ANTARCTICA). Gravitatsionnoe pole i stroenie zemnoi kory Zemli Uilksa i Zemli Viktorii (Vostochnaia Antarktida. Morskie gravimetricheskie issledovaniia, 1970 Vyp.5, p.104-113, In Russian. 21 refs.
QB335.M6

The results of geological studies show positive anomalies on the coast of East Antarctica, while inland, negative anomalies occur, especially S of 70 S and E of 105 E, up to 100-166 mgal. Data on the distribution of the free air anomalies and related subglacial topography and core structure in Wilkes and Victoria Lands are discussed. The altitudes of the areas vary from plus 2000 to minus 1500 m. The negative anomalies were observed in intermontane valleys and in deep depressions, and the positive anomalies of moderate intensity in elevated regions. The deep core structure indicates that the observed region is typically continental and the transition from the Antarctic platform to the oceans occurs rather sharply. Deep faults were found in the transition zone, consonant with the significant gravity lapse observed in the coastal zone.

L-11359
Tarling, D.H.
DRIFTING THROUGH THE YEAR. Nature, Sept. 1, 1972 239(5366), p.38-40
Q1.N2

One of the most significant developments during the year in the field of continental drift and plate tectonics has been an increasing reappraisal and definition of the difficulties which follow from an over simple application of the basic concepts. Developments in the following areas are discussed: the fitting of the continents; the relationship between plate motions and mountain building; the search for old ocean floors; fossils; paleomagnetic studies of Precambrian rocks; new evidence from deep sea drilling; and the association between continental drift and mineral deposits. There has been surprising uniformity in the various assessments of the evolution of the Tasman Sea, with New Zealand fitting close to Australia/Antarctica until 80 m.y. ago after which New Zealand and the Lord Howe Rise separated until the opening of the ocean between Australia and Antarctica caused a northward component to appear some 50 m.y. ago. Due to the increasing evidence for a southern derivation for Madagascar instead of a northern one it appears that the entire arrangement of the continents forming Gondwanaland may have to be readjusted and the subsequent history of breakup modified. Such rearrangements may not be serious in terms of past floral and faunal migration routes for, in spite of possible climatic difficulties, Antarctica still offers the principal connection. On the fossil front, one of the principal developments is the increasing amount of such information from Antarctica.

L-11450
Stroev, P.A.
THICKNESS AND STRUCTURE OF THE EARTH'S CRUST IN THE SOUTHERN OCEAN AND THE COASTAL AREA OF ANTARCTICA. Moshchnost' i nekotorye cherty stroeniia zemnoi kory v IUzhnom okeane i v pribrezhnoi zone Antarktidy. Antarktika; doklady komissii, 1969, pub. 1971, p.42-59, In Russian. 25 refs.
G576.A65

Statistical relationships of the Mohorovicic discontinuity depths and the mean Bouguer anomalies for various types of the Earth's crust in the Southern Ocean and the

Antarctic coastal area were established, based on seismic and gravimetric studies carried out in 1968. The data analysis distinguishes some features of the crustal and mantle structure in fault zones of the ocean, the Atlantic sector, Scotia Sea and Drake Passage. Charts on the depth of the crustal base are given and the structure of the Earth's crust is described.

L-11480
Walton, F.W.
SOUTH POLE STATION REPORT - GEOMAGNETISM, SEISMOLOGY, GRAVITY - DEC. 1967-DEC. 1968. Rockville, U.S. Coast and Geodetic Survey, 1969, 23 + 4p.

Problems encountered and changes made in the seismology, geomagnetism, and gravity research programs by the South Pole Station observer during 1968 are described for the benefit of future observers. Problems in the functioning of the instruments used for each program are described and suggestions concerning living, training, and equipment are made. The geomagnetic and seismic programs collected general data, while the gravity program recorded long period tides in the earth's crust and free oscillations in the earth which are triggered by earthquakes with a magnitude of eight or more.

L-11501
Chiba, H. , Kaminuma, K.
SEISMOLOGICAL BULLETIN OF SYOWA STATION, ANTARCTICA, 1970. Japanese Antarctic Research Expedition. Data reports, March 1972 No.16 (Seismology), 66p.
QC971.R43

Seismological data obtained at Showa Station in 1970 using a three-component HES seismograph and long-period seismographs of three components are reported. The data reflect the date of each event; phase identified by sharpness, ground motion direction, vertical and horizontal components; arrival time in G.M.T.; period of the phase in seconds; amplitude in millimeters; and identifying CGS number where applicable. The instrumental constants and magnification curves of HES and LP seismographs are shown.

L-11536
Anderle, R.J.
POLE POSITION FOR 1971 BASED ON DOPPLER SATELLITE OBSERVATIONS. U.S. Naval Weapons Laboratory. NWL technical report, May 1972 TR-2734, [109]p., 6 refs.

The instantaneous position of the earth's spin axis with respect to the crust has been computed daily since 1969 on the basis of Doppler satellite observations. Improved sets of observing station coordinates and gravity field coefficients obtained in 1970 were used throughout 1971 yielding pole positions with a standard error of about 0.5 meters for the mean of five days of data. However, for some time periods, a bias of about 0.5 meters also exists between the Doppler pole positions and positions reported by the Bureau International de L'Heure (BIH) based on astronomical data. When latitude residuals for 1968 and 1969 are adjusted for changes in station coordinates and gravity field coefficients, the results are biased by several meters for some stations, and corresponding pole positions are biased by about two meters from BIH values. However, spot checks of latitude residuals and pole positions based on recomputed satellite orbits for 1968 and 1969 yielded results consistent with recent data, indicating significant compensation of station coordinate errors by changes in orbit constants. (Auth.)

L-11631
Lewis, R.E.J.
DISTRIBUTION OF EPICENTRES IN THE SCOTIA ARC, 1957-62. British Antarctic Survey. Bulletin, Aug. 1972 No.29, p.21-34, 21 refs.
QH84.2.B72

Seismograms recorded at the Argentine Is. and Stanley I. during the years 1957 to 1962, and at Halley Bay for 1957 to 1959, have been analyzed in conjunction with data published by the Bureau Central International de Sismologie (B.C.I.S.). In this period 162 seismic events were located in the region of the Scotia arc (seismic region 10). Two aspects have been considered: first, the geographical distribution of epicenters and, secondly, the agreement of observation with the travel-time tables of Jeffreys and Bullen (1948) for P-phase arrivals and for some phases reflected at the outer core. Finally, other features of interest on the Argentine Is. and Halley Bay seismograms are discussed. (Auth.)

L-11645
Ushakov, S.A.
ISOSTATIC STATE OF ANTARCTICA AND DEFLECTION OF THE EARTH'S CRUST UNDER THE WEIGHT OF CONTINENTAL GLACIATION. U.S. Air Force Cambridge Research Laboratories. Research translation, May 1964 E-T-R-64-30, 32p.

The major geological structures of Antarctica are reflected in regional Faia anomalies. The continent is divided up according to the nature of these anomalies. Two methods of determining isostatic equilibrium through thickening of the earth's crust to compensate for thickening of the ice cap, are considered. Finally, the role of isostasy in geotectonics is examined.

L-11735
Kropotkin, P.N.
DYNAMICS OF HORIZONTAL MOVEMENTS OF THE EARTH'S CRUST. Dinamika gorizontal'nykh dvizhenii zemnoi kory. Akademiia nauk SSSR. Vestnik, July 1972 No.7, p.80-89, In Russian.

The new global tectonics theory, a contemporary variant of the continental drift theory, is discussed with emphasis on recent findings and summary of the historical process of continental drift since the Carboniferous Age. The displacement picture includes drifting of all parts of Gondwanaland except Antarctica away from the South Pole beginning in the Permian or Lower Mesozoic Age; movement of North America west from Europe beginning in the Triassic; drifting of the East European and Siberian platforms toward each other during the Lower and Middle Paleozoic. Each of the four independent reconstruction methods used supports the above picture: matching isobath contours; matching folded belts of Precambrian and Paleozoic Ages and determining proximity of similar structures of the platformal mantle; paleoclimates; and paleomagnetism. Geotectonic hypotheses can be divided into two groups based on subcrustal currents, and tectonic processes due to changes in the earth's radius, respectively. Recent measurements of the stress state of rocks from underground mines show horizontal contraction that increases according to depth, attesting to contraction of the earth's radius. In order for these findings to lead to understanding of tectonic processes, the continental drift theory must be synthesized with the pulsation theory.

L-11781
Lagrula, J.
PLATE TECTONICS, EXPANSION OF THE EARTH, AND ORIGIN OF THE CONTINENTS. Tectonique des plagues, expansion de la Terre et origine des continents. Academie des sciences, Paris. Comptes rendus hebdomadaires des seances. Serie B, Dec. 6, 1972 275(23), p.881-885, In French. 11 refs.

The main argument in favor of the expanding earth hypothesis is that it furnishes plate tectonics with a powerful motor. But the theory of a polar origin of the continents seems more effectively to explain the existence of dorsals. In this context the theory is associated with rotation of the superficial beds around the line of the poles and with movements toward the equator unleashed by the Ectvos effect and amplified by an expansion the magnitude of which will be measured thanks to progress in the study of coral growth and other phenomena.

L-11794
Falconer, P.K.H.
INDIAN-ANTARCTIC-PACIFIC TRIPLE JUNCTION. Earth and planetary science letters, Dec. 1972 17(1), p.151-158, 25 refs.
QE1.E12

Bathymetric, magnetic and epicentral data have been analyzed and show that the Indian, Antarctic and Pacific plates intersect in a ridge-fault-fault triple junction at 61 deg 30 min S, 161 deg E. The Indian-Antarctic boundary is an active spreading ridge, striking N55 deg E, with a half spreading rate of 3.4 cm/yr. The Pacific-Antarctic boundary strikes N75 deg W from longitude 180 deg to the triple junction. It is an extensively fractured area with the fractures probably striking N45 deg W. The Indian-Pacific boundary is a fracture zone which strikes N25 deg W from the triple junction to the southern end of the Hjort Trench. The trench is probably a continuation of the fracture zone. The observed configuration is in agreement with predictions based on plate tectonics, and would give a stable junction.

L-11796
Mallis, R.
BYRD STATION REPORT: GEOMAGNETISM - SEISMOLOGY; NOVEMBER 1968 - DECEMBER 1969. Rockville, Md., U.S. National Oceanic and Atmospheric Administration, [1970?]. 9p., Unpublished manuscript

Operation of the Coast and Geodetic Survey geomagnetic and seismic observatories at Byrd Station from November 1968 to December 1969 is discussed. Inspection of Byrd Station in general and the observatory facilities in particular revealed no major inadequacies although the Byrd tunnels are steadily collapsing from deformation by the heavy snow overburden. The unheated geomag and seismo tunnel had largely escaped this fate. The observatories should have a lifespan of several more years. Types of instruments, arrangement, and operating conditions are described.

L-11797
Peddie, N.
MAGNETIC RESULTS: SOUTH POLE-QUEEN MAUD LAND TRAVERSE 1, 1964-1965. Antarctic Traverse 5, Rockville, Md., U.S. National Oceanic and Atmospheric Administration, 1968, 7p., 3 refs.

The geomagnetic measurement program undertaken during the Traverse is described and the observations are tabulated. The instruments used were a Varian M49-A Proton Precession Magnetometer and a CARL type 323 Portable Magnetometer, with the CARL used only for measurement of magnetic declination and inclination. Positions were determined with a Kern DKM-2 theodolite. Data are observed values without corrections for daily variation and transient fluctuations but with instrumental corrections applied. Declination, inclination, and total intensity were measured; horizontal and vertical intensity were computed.

L-11798
Galkin, R.M.
DETERMINING MEAN YEARLY VALUES AND ANOMALY OF THE MAGNETIC FIELD ACCORDING TO DRIFT STATION OBSERVATIONS. Opredelenie srednegodovykh znachenii i anomalii magnitnogo polia po rezul'tatam nabliudenii na dreifuiushchikh stantsiiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1970 Vol.288, p.5-13, In Russian. 7 refs.

Mean yearly values and anomoly of the magnetic field are determined in the Central Arctic from observations made on drift stations. Distribution of the difference between mean daily and mean yearly values for the horizontal and vertical components are tabulated for two Arctic stations and Vostok Station, Antarctica. Declination is also tabulated for the same stations. Equations for reducing errors and figuring declination are offered.

L-11810
Yoshida, M. , Yoshimura, A.
GRAVIMETRIC SURVEY IN THE MIZUHO PLATEAU-WEST ENDERBY LAND AREA, EAST ANTARCTICA, 1969-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.168-203, 6 refs.

Gravity measurements were made every 2 km on Mizuho Plateau and every 5 km in West Enderly Land along the JARE 10 and 11 traverse routes. 290 new gravity stations were set up on Mizuho Plateau and 349 in West Enderby Land in addition to 200 previous stations on Route S, which is approximately along longitude 43 E. A LaCoste and Romberg Model G gravity meter No. G 183 was used in both traverses. The gravity values were calculated from observed values in the field on the basis of the gravity value determined at the Pendulum Gravity Station in Showa Station. Results of the survey are tabulated.

L-11811
Yoshida, M. , Yoshimura, A.
GEOMAGNETIC SURVEY IN THE MIZUHO PLATEAU-WEST ENDERBY LAND AREA, EAST ANTARCTICA, 1969-1971. Japanese Antarctic Research Expedition. JARE data reports, Nov. 1972 No.17, p.204-217, 3 refs.

The geomagnetic survey carried out during oversnow traverses of JARE 10 and 11 included measurements of declination, inclination, and total force at 28 stations, and measurement of total force only at 199 stations. The results are given in tabular form.

L-11817
Choudhury, M.A. , Dorel, J.
SPECTRAL RATIO OF SHORT-PERIOD SCP AND SCS PHASES IN RELATION TO THE ATTENUATION IN THE MANTLE BENEATH THE TASMAN SEA AND THE ANTARCTIC REGION. Journal of geophysical research, Jan. 10, 1973

78(2), p.462-469, 7 refs.
QC811.J6

Four pairs of ScP and ScS phases recorded at the station Dumont d'Urville, Adelie Land, at the epicentral distance of about 50 deg, have been frequency analyzed. The slope of spectral ratio has been utilized to calculate the average value of Q beta in the mantle between the Tasman Sea and the station. With Q alpha /Q beta = 1.9, it is estimated that the average value of Q beta = 380. This is much higher than the estimation by H. Kanamori of 230 for the mantle beneath southern Arizona and New Mexico. (Auth.)

L-11861
Embleton, B.J.J.
ON THE UNITY OF GONDWANALAND DURING THE LOWER PALAEOZOIC. Search, Sept. 1972 3(9), p.338-339, 12 refs.
Q1.A772

It has usually been assumed that Gondwanaland existed as a supercontinent comprising South America, Africa, India, Antarctica, and Australia for almost the whole of the Paleozoic. However, in a review of the subject, Creer (1970) expressed the view that the Australian and Antarctic Ordovician poles which are situated to the east of the main Lower Palaeozoic polar region may owe their apparently anomalous positions to the movement of a plate underlying these two continents. Further palaeomagnetic investigation has shown that the Lower-Middle Cambrian poles for Australia also plot close to the Ordovician poles of Australia and Antarctica. In view of the support for the Australian and Antarctic Ordovician poles, it seems quite probable that during the Lower-Middle Cambrian and Ordovician periods, Australia and Antarctica were situated on a plate distinct from the plate occupied by South America and Africa. A reconstruction is proposed which attempts to illustrate the relative positions of the two plates by superimposing the Lower-Middle Cambrian to Ordovician poles obtained from the continents comprising each plate.

L-11862
McQueen, D.M. , Scharnberger, C.K., Scharon, L., Halpern, M.
CAMBRO-ORDOVICIAN PALEOMAGNETIC POLE POSITION AND RUBIDIUM-STRONTIUM TOTAL ROCK ISOCHRON FOR CHARNOCKITIC ROCKS FROM MIRNYY STATION, EAST ANTARCTICA. Earth and planetary science letters, Nov. 1972 16(3), p.433-438, 17 refs.
QE1.E12

Charnockitic rocks from Mirnyy Station have yielded a paleomagnetic pole at 1.5 deg S, 28.5 deg E with a 95 percent confidence oval whose semi-axes are 8 deg and 16 deg. The rubidium-strontium isotopic date for these rocks is 502 my with an intercept of the total rock isochron line on the Sr-87/Sr-86 axis of 0.7194. These results support a reconstruction of Gondwanaland in which the Antarctic Peninsula is closely connected with southern South America.

L-11866
Herron, E.M.
TWO SMALL CRUSTAL PLATES IN THE SOUTH PACIFIC NEAR EASTER ISLAND. Nature physical science, Nov. 13, 1972 240(98), p.35-37, 10 refs.
Q1.N22

Between 9 and 20 m.y. ago, both the East Pacific Ridge, which now outlines the Pacific-Nasca Plate boundary, and the Fossil Ridge, a locus of spreading in what is now the middle of the Nasca Plate, were active, suggesting that the Antarctic Plate, which now occupies the area S of the Chile Fracture Zone between the Pacific-Antarctic and Chile Ridges, extended almost to the equator only 10 m.y. ago. The apparent ease with which the northern boundary of the Antarctic Plate has moved during the past 20 m.y. suggests the triple junction between the Antarctic, Pacific and Nasca Plates has been unstable. New evidence of anomalous plate motions north of the Chile Fracture Zone at 36 S has recently been obtained from seismic and marine geophysical studies. Two anomalous areas of seismic activity in the Pacific between 20 S and 36 S have been investigated. Epicenters near 24 S and 34 S form two well developed rings. First motion directions computed for several earthquakes within these ring-shaped distributions differ significantly from motion computed for epicenters outside these areas. The anomalous areas have been interpreted as outlining two micro-plates between the large Pacific and Nasca Plates. Preliminary results of investigations in these areas are presented.

L-11868
Medvedev, N.D.
GLOBAL DISTRIBUTION OF ZERO ISOPORS OF MAGNETIC DECLINATION D. Geomagnetism and aeronomy, Nov. 1972 12(2), p.333-335, Translation from Geomagnetizm i aeronomiia, 12(2):372-373, 1972. 3 refs.

Data on the distribution of points with zero secular D variations in the Southern, Atlantic, Indian and Pacific Oceans for a period of about 145 years show that the zero isopors of magnetic declination are stable. The closed contours of the zero isopors are the orbital movements of magnetic poles of the Earth in their cyclic rotation with a period of 4000 yrs. The South Magnetic Pole drifts at 12 km/year in a NNW direction in the present epoch.

L-11892
Hughes, T.
DERIVATION OF THE CRITICAL RAYLEIGH NUMBER FOR CONVECTION IN CRYSTALLINE SOLIDS. Journal of applied physics, June 1972 43(6), p.2895-2896, 23 refs.
QC1.J83

The classical theory of thermal convection applies to viscous materials whose linear flow behavior can be described by a Newtonian coefficient of viscosity. When applied to the earth's mantle and polar ice sheets, this theory should be modified so that it holds for viscoplastic materials whose nonlinear flow behavior is described by a non-Newtonian coefficient of effective viscosity. When this is done, the critical Rayleigh number for nonlinear convection flow depends on the thermal stress driving convection and on the parameters of the flow law which describes creep deformation of the viscoplastic material. (Auth.)

L-11918
Pefaur, J.E.
GONDWANALAND, ORIGIN OF THE CONTINENTS, AND ANTARCTIC FOSSILS. Gondwana, deriva continental y fosiles antarticos. Santiago de Chile. Instituto Antartico Chileno. Boletin, 1972 No.7, p.7-12, In Spanish. 15 refs.

The well-known geological, floral fossil, radiometric rock-age determination, and other methods of testing the continental drift theory are reviewed as background to discussion of new faunal fossil evidence supporting the

Gondwanaland theory. Amphibian and reptile fossils have been found in 1967, 1969, and 1970 in the Transantarctic Mountains. The 1970 finds included a Cynodonte (Therapsida) and reptiles of the Thrinaxodon and Lystrosaurus genera. These fossils are very strong evidence of Antarctica's tropical past and simultaneous land connection with other continents. Two photos of reptile cranial fossils are included.

L-11954
Schneider, M.
MEASUREMENT OF TERRESTRIAL TIDES AT VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.93-95, Translated from its Informatsionnyi biulleten', No.80, 1970. 2 refs.

Distortions of earth tide measurements associated with site location are small in Central Antarctica because of the lack of diurnal temperature variations during the polar night, the low value of diurnal atmospheric variations, and the great distance from the ocean. Difficulties in this area are caused by low temperatures, electrostatic charges, and the lack of a motionless base for the instruments. Quantitative recording of gravity tides under the conditions of Vostok Station has been shown by this study to be possible. Electrostatic noise can be reduced by screening; mechanical vibrations and snow settling have almost no effect on the results. The April to October period is recommended for experimentation.

L-11955
Schneider, M.
MEASUREMENT OF TIDAL INCLINATIONS AT VOSTOK STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Nov. 1972 8(2), p.95-96, Translated from its Informatsionnyi biulleten', No.80, 1970. 2 refs.

Problems of earth tide measurement at Vostok Station are compared with those in the Arctic. The performance of tiltmeters depends on a stable zero position, a difficult condition to meet in Antarctica because of the settling and creep of the ice. In the Arctic, ocean tides superimposed on earth tides seriously distort the results. Experiments with levels to determine the direction of snow settling led to the conclusion that tidal inclinations can be measured with horizontal pendulums. Installation and adjustment of the pendulums is described.

L-11962
Purrett, L.A.
ANTARCTIC LEG: DRILLING AMONG THE ICEBERGS. Science news, Dec. 30, 1972 102(27), p.426

Fourteen holes will be drilled in the Ross Sea and Antarctic waters south of Australia by the ship Glomar Challenger. Among the goals are determination of the glacial and climatic history of Antarctica and its effect on global climate, chronology of continental drift, study of fossil distribution in sediments, definition of oceanic circulation patterns, and determination of crustal plate movement history.

L-11984
Ben'kova, N.P. , Khramov, A.N., Cherevko, T.N., Adam, N.V.
SPHERICAL HARMONIC ANALYSES OF THE PALEOMAGNETIC FIELD. Earth and planetary science letters, Feb. 1973 18(1), p.141-147, 10 refs.
QE1.E12

Analytical models of the paleomagnetic field have been constructed for a number of geological periods (Quarternary Neogene, Jurassic, Triassic, Permian and Permo-Carboniferous) by spherical harmonic analysis using the present-day world map as a basis and (for the earlier periods) using also a paleographic reconstruction, based on that of Bullard et al (1965; E-8500) for Eurasia and the other continents around the Atlantic, and on that of Voronov (1967; E-7313) for Africa, Antarctica, India, and Australia. The results for all periods indicate that throughout the past 300 my the geomagnetic field has maintained its global structure, and has remained similar to the field of a dipole slightly shifted from the Earth's center. It appears that there have not been any persistent systematic anomalies or variations in the Earth's magnetic field throughout that time, but rather that the field has been oscillating around a mean level not greatly different from that of the present epoch.

L-12064
McElhinny, M.W.
MANTLE PLUMES, PALEOMAGNETISM AND POLAR WANDERING. Nature, Feb. 23, 1973 241(5391), p.523-524, 8 refs.

Consideration is given the question of whether or not there has been any slip of the lithosphere as a whole with respect to the Earth's axis of rotation over the past 50 m.y. This can be done by finding the vector sum of the horizontal displacements of all points on the Earth's surface with respect to the axis of rotation during this interval. An estimate of the net displacement over the past 50 m.y. can be made using paleomagnetic data for the six major plates of Le Pichon -- the Eurasian, American, African, Pacific, Indian, and Antarctic plates. The analysis suggests that there has been no significant motion of the lithosphere as a whole with respect to the Earth's axis of rotation over the past 50 m.y. However, if the plume calculations of Duncan et al (1972) are accepted it is concluded that the lithosphere remains relatively fixed with respect to the rotation axis, but that the mantle inside moves with respect to the same axis. The alternative conclusion is that the underlying assumption made by Duncan et al, that plumes are fixed relative to the mantle, is incorrect.

L-12129
COMITE NATIONAL FRANCAIS DES RECHERCHES ANTARCTIQUES, INFORMATION BULLETIN NO.49. Comite national francais des recherches antarctiques, bulletin d'information no.49. France. Ministere d'Etat charge des departements et territoires d'outre-mer. Terres australes et antarctiques francaises, Oct.-Dec. 1971 No.57, p.49-79, In French.

The usual magnetic and meteorological measurements for the French Antarctic territories are tabulated for the July-December 1971 period. Magnetic measurements include K indices and summary morphological analysis. The meteorological measurements include climatological, aerological, and, for all Antarctic stations, average monthly temperature data.

See also:
A-11961,B-12101,E-10052,E-10191, E-10202,E-10206,E-10308,E-10309,E-10319, E-10385,E-11057,E-11220,E-11250,E-11292, E-11293,E-11295,E-11296,E-11297,E-11298,

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J-12139,K-10111,K-11182,K-12052

M. POLITICAL GEOGRAPHY

M-10035
Antarctic Treaty Consultative Parties
REPORT OF FIFTH ANTARCTIC TREATY CONSULTATIVE MEETING. Polar record, May 1969 14(92), p.663-686
G575.P6

The fifth Antarctic Treaty Consultative Meeting was held in Paris on Nov. 18, 1968 for the purpose of discussing and recommending to the signatory parties measures in furtherance of the principles and purposes of the Treaty. The agenda included the following matters: (1) Conservation of Antarctic fauna and flora; (2) Pelagic sealing; (3) Amendments, measures, and recommendations on conservation efforts; (4) Report on Meeting of Logistics Experts in Tokyo, 3-8 June 1968; (5) Telecommunications; (6) Meteorology; (7) Tourist activities in the Antarctic; (8) Commemorative postage stamp; (9) Historic monuments; (10) Co-ordination Group for the Southern Ocean; (11) Co-ordination of General Meetings of SCAR and Consultative Meetings of the Antarctic Treaty.

M-10036
Antarctic Treaty Consultative Parties
REPORT OF SIXTH ANTARCTIC TREATY CONSULTATIVE MEETING. Polar record, May 1971 15(98), p.729-742
G575.P6

The sixth Antarctic Treaty Consultative Meeting was held in Tokyo on Oct. 19, 1970 for the purpose of discussing and recommending to the signatory parties measures in furtherance of the principles and purposes of the Treaty. The agenda included the following matters: Regulation of Antarctic Pelagic Sealing; Antarctic Meteorology; Telecommunications; Conservation of Antarctic Fauna and Flora; Historic Monuments; The Effects of Man and his Activities upon the Antarctic Environment; Experiments using Radio-Isotopes; The Effects of Antarctic Tourism; Launching of Scientific Research Rockets; Exchange of Information on Ocean Research Vessels.

M-10057
Fioralisi, L. , Pierotti, T.
ANTARCTICA, A FUTURE THEATER OF OPERATIONS. L'Antartide, futuro tearto operativo. Rivista aeronautica, astronautica, missilistica, Jul.-Aug. 1971 47(7-8), p. 1383-1389, In Italian.

Possible strategic uses of Antarctica in an East-West conflict are considered, assuming that such a conflict would take the form of a conventional war of long duration, rather than that of indiscriminate use of the most destructive weapons. After briefly describing the geographical characteristics, climate, possibility of life, and existing bases on Antarctica, and reviewing the problems of sovereignty and provisions of the Antarctic Treaty, the authors examine the importance of the continent and surrounding waters from the strategic point of view. They conclude that while the shortest lines of offensive between the two potential protagonists pass through the North Pole, important supply lines of the West lead around South America and Africa. These supply lines could be maintained or disrupted depending on who controls Antarctica.

M-10088
ANTARCTIC TREATY. Survey of British Commonwealth affairs, Sept. 1970 4(19), p.791-794

The background and provisions of the Antarctic Treaty which was signed in 1959 by the countries active in the Antarctic area are reviewed. At the present time scientists from 10 of the 12 original Antarctic Treaty nations are manning 34 stations (out of 44 previously active stations) in the treaty area (S of 60 S) The British contributions to Antarctic studies since 1944 and whaling problems are discussed briefly. The 11th meeting of SCAR and a Symposium on Antarctic Geology were held in Oslo in Aug. 1970, and on Oct. 19, 1970, the 6th Antarctic Treaty Consultative Meeting will open in Tokyo, Japan providing a forum for the discussion of common interests in the Antarctic.

M-10096
Sollie, F.
ARCTIC AND ANTARCTIC - CURRENT PROBLEMS IN THE POLAR REGIONS. Cooperation and conflict, 1969 4(2), p.124-144
DL55.C66

A survey is made of the present situation and practical problems related to polar exploration with particular reference to Norwegian interests. The discussion includes the long-term implications of the Antartic Treaty as a model for international scientific cooperation and the considerations involved in exploitation of natural resources under the high seas (continental shelf and seabed) Scientific and technological developments have made it necessary to determine the status of 'new' regions and to decide if they are to be open for annexation by individual states or if they are to be joint international territories common to all mankind. The question exists in Antarctica, where the Antarctic Treaty provides only temporary postponement, as well as in the Arctic where some states maintain that an apportionment must be made according to the sector principle.

M-10633
Armstrong, T.
BELLINGSHAUSEN AND THE DISCOVERY OF ANTARCTICA. Polar record, Sept. 1971 15(99), p.887-891, 6 refs.
G575.P6

The argument of the Soviet historian, M.I. Belov stating that Bellingshausen knew the significance of discovering an ice continent and published narrative to this effect had been subjected to editorial changes by the Russian Admiralty is refuted. The idea that such a continent existed grew slowly during the first half of the 19th century as more evidence accumulated, and it would be hard to attach a date to the final realization. Bellingshausen's contribution to the idea was a very important one, but the contention that heavy editing of his book deprived him of making a still greater contribution must be regarded as unproven.

M-10649
Antarctic Treaty Consultative Parties
POSTAGE STAMP ISSUES TO COMMEMORATE THE TENTH ANNIVERSARY OF THE ANTARCTIC TREATY. Polar record, Jan. 1972 16(100), p.104-105
G575.P6

The Antarctic Treaty, signed in Washington, D.C., on Dec. 1, 1959, entered into force on June 23, 1961. At the Fifth Antarctic Treaty Consultative Meeting, held in Paris in Nov. 1968, the representatives recommended to their governments that on the tenth anniversary of the treaty each consultative party should issue a commemorative stamp during 1971. Stamps have so far been issued in 1971 by Australian Antarctic Territory (June 23), Belgium (June 19), British Antarctic Territory (June 23), Japan (June 23), New Zealand (June 9), Norway (June 23), Republic of South Africa (May 22), USSR (June 21), USA (June 23) and France.

M-10952
ANTARCTICA - A CONTINENT APART. Scientiae, Dec. 1971 12(12), p.2-4
Q1.S8148

1972 marks the beginning of the second decade of the Antarctic Treaty; on June 23, 1971, the 10th anniversary of the implementation of this unique political contract was celebrated. Since 1961, scientists in Antarctica have amassed a vast amount of scientific knowledge which is of relevance not only to that continent but to the world as a whole. As a signatory to the Antarctic Treaty, South Africa has maintained SANAE station continuously since 1959. An additional wintering-over station, Borga Base, was established in the Ahlmann Ridge area in 1969. The thirteenth South African National Antarctic Expedition left Cape Town on Jan. 6, 1971.

M-10955
Ptitsyn, V.I.
SOME PROBLEMS OF INTERNATIONAL SCIENTIFIC COLLABORATION IN THE ANTARCTIC. Antarctic (Antarktika), 1971, p.18-30, TT 67-59072, Transl. from Antarktika; doklady komissii, 1965. Moskva, Nauka, 1966. 10 refs.

The most important principle of the Antarctic Treaty, which went into effect in June 1961, was the promotion of peaceful utilization of the Antarctic. Building military bases, conducting maneuvers, and testing weaponry were specifically prohibited, and the right of free inspection of all regions and all stations was given to each of the signatory parties. Provisions were made for coordination of national programs and exchange of scientific information in order to prevent duplication of effort. The law of hospitality operates in the Antarctic. The conclusion of the Antarctic Treaty is one of the clearest indications of the possibilities for fruitful solution of complicated international problems. Certain provisions of the Treaty may be used in establishing international legal regulation of outer space, and the principle of free scientific investigation sets an important precedent for future international cooperation in other areas of scientific interest. (For Russian original see M-5039)

M-11479
Wilkes, O.
MISSILES IN ANTARCTICA. New Zealand monthly review, July 1967 8(80), p.6-7

The February 28, 1967 American announcement that a program of rocket launchings would begin near McMurdo Station in 1969 for research purposes is viewed here with distrust. It is wondered why the announcement was made so quietly with no fanfare about research benefits. The purpose of the extensive preparations involved in building a launch pad at some distance from McMurdo and the setting up of emergency equipment duplicating that at McMurdo is questioned. Finally, it is pointed out that the Nike (planned as the first stage) is commonly a military missile, not a research rocket. The potential of the launch pad is shown by comparisons with rocket base development in the Arctic.

M-11923
Gajardo Villarroel, E.
IMPORTANCE OF THE ANTARCTIC TREATY FOR PEACE AND DISARMAMENT. Importancia del Tratado Antartico para la paz y el desarme. Santiago de Chile. Instituto Antartico Chileno. Boletin, 1972 No.7, p.23-31, In Spanish.

Provisions of the Antarctic Treaty relating to peace and disarmament are enumerated and discussed. Points of significance include the banning of nuclear explosions, encouragement of cooperative research, the freezing of territorial claims at the 1959 position, stimulation of disarmament by neutralizing a whole continent, etc.

M-12154
MINERALS IN ANTARCTIC CONCERN NATIONS. Antarctic, Dec. 1972 6(8), p.270-272

Recommendations adopted by the seventh consultative meeting of representatives of the 12 Antarctic Treaty nations in Wellington in Nov. 1972 recognized that mineral exploration was likely to raise environmental problems and that visits to the continent by tourists and private expeditions could affect both scientific programs and the environment. Concerns expressed by the various treaty nations included the problem of national sovereignties should mineral prospecting take place on the Antarctic Continent, the threat of creeping pollution and environmental destruction posed by increasing ease of access to the continent, and possible threats to the continued proper working of the treaty. In addition to the recommendations on the possible effects of mineral exploration, the meeting adopted recommendations dealing with cooperation in transport arrangements, organization of telecommunications, preservation of areas of particular scientific interest, rules of conduct for visitors, historic monuments, the importation of lab animals and plants, man's impact on the environment, and a review of specially protected areas. Also considered at the meeting were possible activities or territorial claims in Antarctica by nations that are not parties to the Antarctic Treaty and legislative and/or administrative action to conserve fauna and flora.

See also:
A-10423,A-10471,A-10986,A-11085,
B-10963,B-10997,B-12207,D-10789,D-11443

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